

40 Pak ©

# POPULAR Computing WEEKLY

6-12 December 1984

*It's the best selling weekly*

Vol 3 No 49

## Atari 800XL price slashed

ATARI has further slashed the price of the Atari 800XL (see *Popular Computing Weekly*, November 22).

The retail price is now down to £129, a reduction of almost 25% from its previous price of £169.

The new price follows the announcement three weeks ago in the States that the 800XL would sell for just \$120 (about £100) over there.

The aggressive price cutting of the 800XL — Atari's only home computer in the Christmas market now that the 600XL model has been dropped — reflects Atari boss Jack Tramiel's policy of "marketing

for the masses".

"Manufacturing advances in high technology products mean that prices should be tumbling," commented Tramiel.

"Technology is what this decade is about. I've given this notion to my factories out in the Far East. They're going to produce it at the price the man next door can afford."

Atari factories worldwide are currently producing about ten million machines per year. A large proportion of these are targeted for the European market for 1985. Atari has recently appointed a European marketing manager, M. Rosi.



Further bargains for the Atari 800XL are available if you shop around. Laskey's, for instance, has an Atari Starter pack consisting of the computer, a joystick, data recorder, Introduction to Basic manual and one piece of software — which can be chosen from a selection — all for £170.

### Prestel breached

PRESTEL, the British Telecom database, has suffered a second serious breach of its security.

On Sunday night a group of 'hackers' broke into Micronet only days after Prestel installed new security codes claimed to be unbreakable.

The 'hackers' took action after Prestel removed its second biggest information provider — Timeframe — from the system. Timeframe was asked by Prestel to withdraw a claim

continued on page 5

## Minter lights up

JEFF MINTER, author of Llamssoft Commodore classics including *Sheep in Space* and *Attack of the Mutant Camels* is soon to release his first non-games title for the C64 — to be called *Psychodelia*.

The program is best described as a light synthesiser, where the user can create moving patterns of ever changing colour on screen (best done listening to a favourite LP) using a joystick.

The program operates much like a sound synthesiser — only with light — and it is



continued on page 5



Oric's new IQ164 computer — details inside.

INSIDE > MIDI KEYBOARD > ADVENTURE COMPETITION >



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**I**f I was thinking of buying a micro this Christmas I would be looking pretty closely at the Atari 800XL.

Atari last week slashed its price once again so that it now costs only £129 — the same price as the 48K Spectrum.

Yet the Atari has 64K Ram and offers a number of features found only on more expensive machines — it has a better keyboard than the Spectrum Plus which costs £179. It has four sound channels, one more than the Commodore 64 which costs £199. The Spectrum models have only a one-voice squeak. The 800XL has a cartridge port and twin joystick ports, unlike the Spectrum models. It even has a monitor socket, sprite graphics and a display with up to 256 colours on screen at any one time.

In the words of Atari's latest ad the 800XL has now well and truly "socked the competition".

It's a big gamble. Before Jack Tramiel — Commodore's founder — split away and bought Atari in June the company had been losing \$800m a year.

He has worked quickly. We now have a considerably slimmed down Atari that is proving to be very aggressive in the market. He has just borrowed a further \$150m from his US investors push Atari back into the limelight. "Too many people have got too fat out of this business", he says.

The only problem with the Atari 800XL is software. The best programs are still unquestionably to be found on the Spectrum and Commodore 64 machines. Still, that should come if Tramiel's plan works.

The Atari 800X is now a very attractive purchase at £129. It makes Sinclair's Spectrum Plus — without either ZX Interface 1 or 2 built-in — look a bit mean, and the Commodore 64 look very overpriced.

It makes the £275-plus MSX micros look like no-hopers.

## Presents...

**News** Oric's new IQ164 > Spectrum + problems

**Competition** > Adventure competition to win *The Sandman Cometh*

**Star Game** > Ashley Watson challenges your piloting skills with Lunar Module on the Dragon 32

**Software Review** > McGraw Hill's QL Assembler reviewed by Andy Pennell > Psion's Matchpoint on the C64

**Streetlife** > Christina Erskine views robots in action at Ford Motors on the Sierra line

**Hardware Reviews** > Disc interface for Spectrum > Siel MK900 music keyboard

**Spectrum** > Reverse your Polish on any Spectrum thanks to Richard Armstrong

**Commodore 64** > A parallel printing routine from Adrian Warman

**BBC & Electron** > How to print out user defined graphics on your Epson

**Amstrad** > The depths (and heights) of the Amstrad CPC 464 revealed by Colin Harris of Nemesis Software

**Best of the Rest** > Letters 9 > Dragon 45 > Flight Simulator Result 51 > QL Page 60 > Elite Competition 64 > Open Forum 72 > Arcade Avenue 72 > Microradio 75 > Baud Walk 76 > Music Box 78 > Book Ends 80 > Peek & Poke 84 > Adventure Corner 88 > Readers Chart 98 > Top Ten, Diary 98 > New Releases, This Week 99 > Ziggurat, Puzzle, Hackers 102

## Futures...

Which MSX? We spot the differences... And a machine-code taster of Jeff Minter's new *Psychodelia* to type in



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ABC

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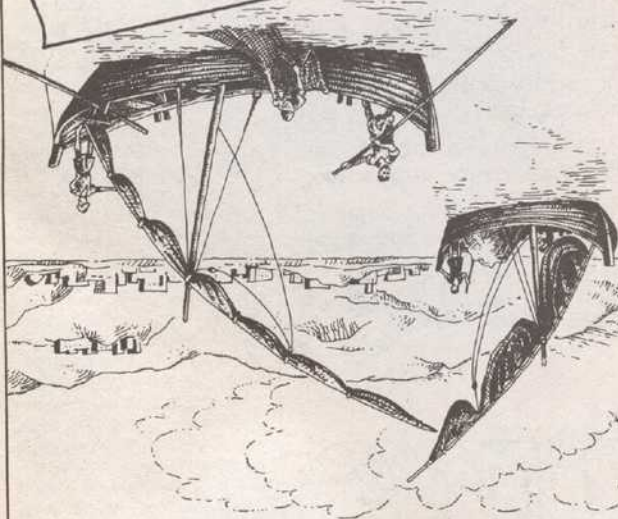
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SHARDS SOFTWARE PRESENTS ...



## Psychedelia

continued from page one

possible to produce pre-programmed sequencing, and pre-set shapes. You can define the starting shape from which the program constructs its patterns and you can control the colour rotation sequence.

A number of built-in 'planes of symmetry' can be switched in or out to produce multiple images on-screen.

Further variation can be achieved by altering the bandwidth and the pulse length of the shape 'trail' which changes how the joystick effects the patterns. Finally, it is possible to record pattern sequences and then play them back.

"I enjoy writing games but I wanted to write something totally non-competitive but at the same time great fun to play and experiment with," explained Jeff Minter.

*Psychedelia* is being released in mid-December for the Commodore 64, C16 (which has a 128-colour display) and Vic20, priced at £7.95.

## QL releases

IN THE same week as Psion's QL chess program is to be released Sinclair has announced a number of other new QL titles, which will become available before January.

An assembler package has been produced by GST which will be priced at £39.95.

*QL Toolkit* written by Tony Tebb and Sinclair adds 60 new commands to SuperBasic including full multi-tasking. *QL Toolkit* will sell for £24.95.

*QL Cash Trader* written by Accounting Software giving a dynamic profit/loss accounting system will sell for £39.95.

Finally, *QL Linker* from GST is a relocating linker for programs written in compiled languages of M68000 assembler.

## CPC464 Forth

NEW hardware and software products have been announced for the Amstrad CPC464 by Skywave.

The company has produced an RS232 communications interface priced at £71.30, and also a Forth (Fig Forth standard) language package on cassette, priced at £20.70, for the machine.

Details from Skywave, 73 Curzon Road, Boscombe, Bournemouth.

## New IQ164 details

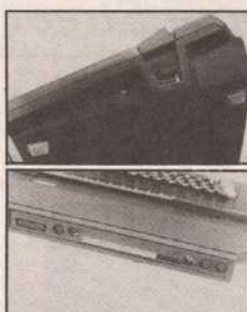
THE new IQ164 Oric machine, due for launch in January on the continent (as the Stratos) and in the UK shortly afterward, will be priced around £250.

The machine looks remarkably similar to the Atmos, using the same keyboard and black and red colouring on the casing.

The two cartridge slots on the upper left-hand side will offer a total of 112K Rom space for languages and applications programs. The machine contains no internal Rom — Basic is provided on a plug-in cartridge.

When Basic is used the function key can be used simultaneously with the other keys to give a single Basic keyword entry.

The machine also offers a Centronics printer interface,



two modem ports — one RS232, one V23, two Atari-style joystick ports, a cassette socket and both UHF and RGB/Peritel TV connections. It has a built-in disc controller and a Shugart 34-pin interface — giving the option to use 5inch discs as well as Oric's 3inch Hitachi-based discs.

## Spectrum+ hits snag

SINCLAIR's Spectrum+ computer has run into reliability problems and the number of faulty machines has resulted in a severe shortage of the micro in the shops.

"The shortage of Spectrum+ machines is having a devastating effect on the Christmas market," said John Flatman, of Boots' computer buying department. "People are waiting until the machine finally arrives rather than buying an ordinary Spectrum, and it seems there are severe quality problems with the machine."

At W H Smith, a spokeswoman confirmed that the shops were not getting as many machines as they needed.

"We have been having problems with the keyboard in that many of the keys seem to be loose. Consequently, we have been looking at them and tes-

## The Net spreads

MICRONET 800 is expanding abroad. A franchise to run Micronet has been given to the Hong Kong telephone company and Swedish PTT.

The Swedish franchise will make Micronet available to users in Sweden, Norway and Denmark.

Micronet's managing director, Tim Schoonmaker, says this is just the beginning. "Our next target is to take Micronet 800 to micro users in Australia and the United States."

ting them as they come out of the boxes.

"Recently the problems haven't been quite so bad as they were to begin with, and we are beginning to get replacements, though not enough."

"I am not aware that the situation is at all difficult at the moment," said Sinclair spokesman. "My impression is that things are a lot more positive this year than they were twelve months ago."



## Prestel

continued from page one

that Prestel's security had been broken and when they failed to comply Prestel removed them from the system.

Angry hackers then succeeded in breaking into Micromouse on Micronet leaving the message "Bring back Timeframe — hack of the century".

The same group is also apparently attempting to break into BT's prestige information service BT Gold.

## Elite bugged

THE Electron version of *Elite*, Acornsoft's top selling game has run into problems.

A bug has been found that means Hyperdrive between galaxies is impossible in the cut-down Electron version, making the playing area an eighth the size of its BBC counterpart.

An Acornsoft spokesperson commented "the single galaxy restriction does not affect the actual playing of the game. It is still possible to achieve Elite status."

Acornsoft Managing Director, David Johnson-Davies explained further:

"There is a bug in the program that means the game is played in one galaxy, but this does not affect the playing of the game — Elite status can still be attained."

"We regret the bug is present but, given the complexity of the game, it is difficult to guarantee the lack of bugs."

"However, if customers feel strongly about the matter, we will refund their money."

Acornsoft says that it is currently working to cure the problem and is looking at the possibility — if an eight-galaxy version can be produced — of replacing one-galaxy copies already sold with the corrected version.

Until it is known whether or not the problem can be solved, Acornsoft has no plans to alter the documentation supplied with the game, despite the fact that it clearly states that Hyperdrive is possible.

## Micronet

Following last week's News Desk item headed *QL network by Prism*, we would like to make clear that Prism no longer has any connection with Micronet which is run jointly by EMAP and British Telecom.



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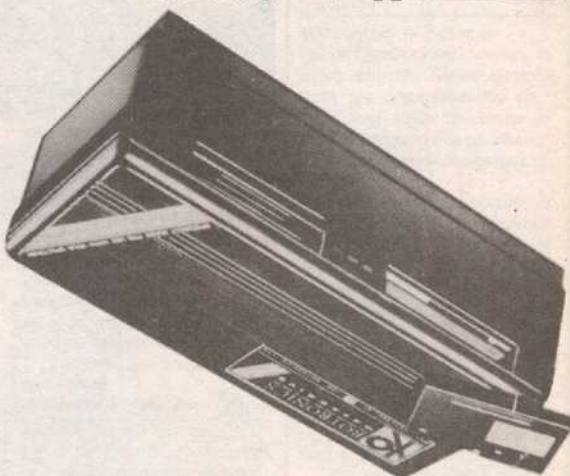
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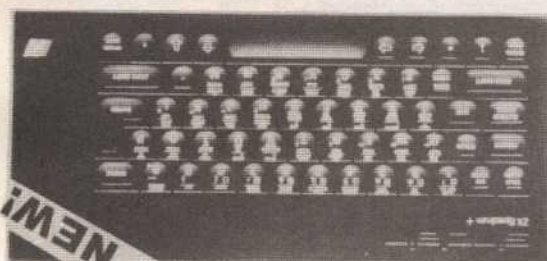
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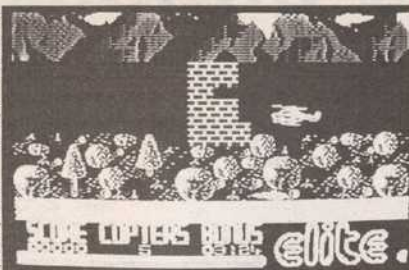
**AIRWOLF** is the latest game from Elite Systems based on the ITV series of the same name.

The player must guide his helicopter through 12 playing

screens to rescue, one by one, six kidnapped scientists.

The program will be available this month for the Spectrum priced at £6.95, and the Commodore 64 at £7.95.

● Following the Elite launch, advertisements for a forthcoming Ocean game, also entitled *Airwolf* have been withdrawn.



## Sir Clive goes on show

A WAXWORK model of Sir Clive Sinclair will be on show in Madame Tussauds from next April.

Work on 'Sir Clive' himself has now been completed, but he will not be put on display until a model of Selina Scott is finished, as the two will appear in a tableau together.

"Sir Clive will be shown holding one of the Sinclair pocket TVs," explained a spokeswoman for Madame Tussauds. "Selina Scott will be looking over his shoulder, looking at the TV screen, on which there will be a picture of herself."

## Free bundles

TOSHIBA is currently offering three software packs bundled free with its new Toshiba HX-10 MSX computer.

The three packs are CDS Micro Systems *French is Fun*, Ocean's *Hunchback* and *Manic Miner* from Bug Byte.

"These three were chosen largely because we wanted chart-topping products, such as *Manic Miner*," said a Toshiba spokesman. "But we are keen to emphasise that MSX does not just mean games machines, so *French is Fun* was added to the list."

## Learn to read ...

SINCLAIR has released a further 13 educational titles for the Spectrum and Spectrum+.

Two — *Estimator Racer* and *Number Painter* — are ASK titles produced in association with Psion and priced at £4.95.

The remaining 11 at £7.95 are Sinclair Macmillan programs. Four of these are science simulations written by Five Ways and five are additions to the Learn to Read series from Fisher Marriot.

## Tickets still to be claimed

A NUMBER of winning raffle tickets from the 14th ZX Micro-fair held on November 17 to 18 are still unclaimed.

The prize winning ticket numbers are as follows:

**Green** — 570, 582, 589, 834, 768, 879, 474, 993, 615, 871, 949, 825, 472, 309, 736, 697, 496, 684, 454, 817, 347, 303, 862, 900, 964, 478, 382, 271, 557, 275, 295, 420, 632, 347, 679, 711, 520, 348, 303.  
**Red** — 770, 395, 506, 454, 645, 812, 515, 458, 960, 628, 782, 763, 402, 461, 475, 413, 436, 503, 493, 473, 372, 389, 413, 606, 411, 524, 806, 436, 611.  
**White** — 230, 344, 201, 140, 503, 664, 498, 393, 889, 339, 502, 650, 120, 693, 474, 284, 89, 110, 148, 422, 200, 264, 148, 64, 187, 422.  
**Blue** — 34, 111, 73.

The raffle, in aid of Capital Radio's 'Help a London Child' raised over £700 for London children in need.

The first prize was won by Mr M Slatford of S Croydon, Surrey.

If your ticket number appears above write to: ZX Raffle, 71 Park Lane, Tottenham, London N17 0HC, enclosing the ticket and a label with your name and address.

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## QLUB fights back

In answer to the several points raised in R. Haigh's letter in the November 15 issue, Sinclair Research should like to point out that:

1) The second QLUB News was distributed on November 12 and our records confirm that R Haigh was part of that mailing.

2) The new-version Psion update will be offered free of charge to QLUB members as part of their membership entitlement. We may subsequently offer these up-dated versions to non-QLUB members but there would be a charge.

3) While R Haigh may feel that he does not need Psion software assistance, experience to date suggests that a large number of QLUB members do very much value this service — so far some 8,000 enquiries have been handled.

QLUB Editor  
Sinclair Research  
Cambridge

## Ultimate news 1

I am writing this letter to put Mr N Brailsford who asked about Ultimate games on the 64, out of his misery. Ultimate have already produced a version of Jet Pac on disc — although I must admit that my Jet Pac is a pirate copy of a pre-release version.

PS Ultimate have released a game called The Staff of Karnath for the 64.

PS Sorry about the pirate version, Ultimate!

D Page  
2 Park Approach  
Welling  
Kent

## Ultimate news 2

I wish to stake my claim to be the first person to complete Ultimate's new Megagame/Movie/Classic program Knight Lore. After two weeks of solid playing I stirred in the last charm and was cured. This historic event (!) took place on Friday the 23rd of November at 6.19pm for those who wish to challenge my

claim. I won't say exactly what happens as it will spoil the aim of the game for other people. Seeing as the cassette inlay is so vague, as are reviews, here are a few playing tips:

- 1) You need two of each of the seven charms.
- 2) You must drop them in the cauldron in the correct order.
- 3) This is indicated by the cauldron steam.
- 4) You can't have three or more objects in a room.
- 5) You can drop and pick up, objects simultaneously.
- 6) Keep track of what you have collected.
- 7) Make a map!

Andrew Wappat  
15 Darngate  
Longthorpe  
Peterborough

## Misleading review

Your Book Ends review of Adrian Dickens' The QL Advanced User Guide (Popular Computing Weekly, November 15) is extremely misleading in its references to the 'Sinclair QDOS manual'.

This manual was in fact a preliminary draft of the QDOS documentation — a working piece of documentation which has never been published in any official form. It has been supplied by Sinclair Research Limited only to software houses who have applied for it.

Anyone subsequently seeking permission to quote from the manual has been warned of possible errors, and permit-

ted to proceed only and entirely at their own risk, on condition that Sinclair's copyright in the material is acknowledged.

Sinclair expects to publish shortly its own comprehensive official Software Developers Guide.

Software Department  
Sinclair Research  
Cambridge

## Imagine a micro

Even in the advanced digital microcomputer world we still have an electro-mechanical problem — the mass storage devices called disc drives.

A low-priced home micro costs around £150 — the disc drive which goes with it still costs up to £230. For the non-professional user a disk drive therefore seems rather expensive for what it does — storing and retrieving data — in comparison with the multitude of basic functions of the micro-keyboard, video-control, music, programming.

To be complete a drive has also secondary functions: the organisation of the data (Copy, Delete, Merge, Directory). It is these functions which make the drive so expensive.

Supposing it was possible to execute these secondary functions inside the computer without intervention of the mass storage device after the data is loaded.

I imagine a micro with 512K Ram and a fast tape or streamer as a mass storage device. Loading and saving memory would only be possible in sequential blocks of a fixed length: say, 192K Ram. This would make the tape operation very simple — a computer controlled start at the beginning and a stop at the end of the block. Without making the streamer too expensive it still must be possible to Load or Save a block in less than 15 second. Organising the data before saving would also be very easy, it would only be a matter of changing the data locations in the memory. Random accessing would no longer be a time consuming operation. With 512K Ram as memory it would be possible to

have two of the memory blocks present in the computer for merging and copying files. Moreover the DOS could be replaced by a simple, short menu-driven program.

It must be possible to build and sell a micro like this with a built-in fast tape unit for less than the cost of a micro plus disc drive — £400.

Cormon Eddy  
Hof Van Tichelen 26  
B2020 Antwerp  
Belgium

Is the QL the kind of machine you had in mind?

## Dragon still fiery

I was very disappointed to read in last week's Popular Computer Weekly that you were surprised at the large turn-out at the 6809 show.

The Dragon is alive, well and kicking like mad with a lot of support from a lot of not so small companies — not to mention a lot of owners who obviously don't think the Dragons are dead.

So many reviewers in the computer press obviously never switched on their review samples of the Dragon. If the number of non-existent Rom-bugs they all found is anything to go by it amazes me that it sold at all.

The Dragon is without a doubt far superior to the BBC, Spectrum and QL (I nearly forgot the Spectrum Plus with its drop-off keys which allow one to completely redesign the keyboard layout) etc, which is all most magazines (including yourselves) seem to class as computers.

If only the reviewers had bothered to admit that all they did was read the manual and base their review on that we might still have Dragon Data. If I appear to be upset it is because I am very disappointed to see the computer press are still kicking the Dragon when it is (a little) down.

Long live the Dragon.

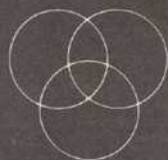
J E Slad  
3 Bridges Close  
St Nicholas-at-Wade  
near Birchington  
Kent



"What do you suppose Jack Tramiel's trying to do?"



LOGIC 3



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**CHRISTMAS COMPETITION!**

LOGIC 3

# Spectrum Club

BRITAIN'S No.1 SOFTWARE CLUB  
WINTER ISSUE 1984/85

## WIN A MICRODRIVE

**Christmas Competition**  
1st prize: ZX Microdrive & ZX Interface 1 (worth over £70)  
2nd prize: Currah µSpeech Synthesizer (worth £29.90)  
10 runner up prizes of free games software (each worth over £10)

To celebrate the Christmas season Logic 3 are running a grand Christmas Competition with a ZX Microdrive and Currah µSpeech Synthesizer as first and second prizes.

The ZX Microdrive, complete with Interface 1, is undoubtedly the ultimate Spectrum add-on to be allowing programs and data to be quickly saved and recalled. The Currah µSpeech is both powerful, featuring an infinite vocabulary, and easy to use.

To enter the competition carefully read the reviews in this catalogue then answer the questions in the Quiz and mail your answers before 31st January. Prizes will be awarded to the first 12 correct entries drawn.

Here's your chance to win these desirable Spectrum add-ons, but don't leave it too late, make sure your entry reaches Logic 3 before the closing date!



### CLUB SUCCESS

The Logic 3 Spectrum Club was launched in July, 1984 and has been an outstanding success. Already more than half-way to its target of 10,000 members in twelve months, the continuous growth of the club has kept Logic 3's staff working seven days a week just to keep up with demand.

Tony Toller, Logic 3's managing director and coordinator of the Club, explains its success as follows: "With other clubs once a person has joined there is no more reason for the club to try to support its members who each month have to purchase a certain number of products from a short list. Our Club is different. Members have no obligation to purchase any products from the club so the pressure is on us to choose only the best quality products and offer the best possible prices. We also take a lot of pride in publishing independent reviews on all the products we carry and if we do not like something about a product we are not afraid to say so."

Tony Toller's policy of offering Club members a real service rather than just running "yet another mail order business" is winning new members all the time. But size by itself is not the main objective "as we grow so we will be able to improve our service to members still further and perhaps, one day, develop the club catalogue into a proper magazine." With the Christmas edition of the catalogue already running at a bumper 20 pages containing reviews of more than 180 products that day may come quite soon!

## INSIDE

- ★ **EDUCATION**  
A selection of the most effective educational programs available  
Designed for children from the age of 4 to 16.
- ★ **GAMES**  
The best games for the Spectrum selected by our own review panel and rated according to: graphics, sound, colour, originality and interest.
- ★ **PROGRAMMING**  
The 'Learn BASIC' tutorials really show you how to write structured programs in easy to understand stages.
- ★ **UTILITIES**  
Design your own games.
- ★ **HARDWARE**  
Some good deals in hardware and peripherals.

## LOGIC 3'S SOFTWARE PANEL

Neil Atkinson, pupil of Sir William Borlase School, spends his weekends in a shop selling home computer software, intends to work as a journalist.

Andrew Goltz, director of Logic 3, spent 6 years with Commodore's UK and International Division, instigated Commodore's 'Approved Product' scheme for third party software.

Bliss Healey, graduate of London School of Economics, has translated business software into French, currently working on the design of graphics for educational software.

Tony Toller, director of Logic 3, former journalist, specialist in business applications on Micros and co-ordinator of Logic 3's software club.

## Spectrum Club

The Logic 3 Spectrum Club has something for everyone: regular reviews, excellent savings on all the latest top quality games and educational software, and discounts on hardware.

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Join Logic 3 Spectrum Club within 60 days and benefit from our new members introductory offer to purchase our "Software Specials" at a huge discount.

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LOGIC 3

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**BERKS.**

Yes, please rush me a  
copy of your Software Club catalogue

I have a ☐ ZX Spectrum ☐ Commodore 64  
(tick box)

Name .....

Address .....



## Perchance to dream

This week we offer you the chance to enter an intriguing adventure puzzle based on the new epic adventure, *The Sandman Cometh* by Star Dreams

### The Prize

*The Sandman Cometh* is an adventure through the dark side of the mind, where logic is twisted and opposites meet. The objects of material reality are seen in strange new guises, the substance of the mental world holds sway.

To solve *The Sandman Cometh* you will need to learn the significance of dreams from Freud, symbols of reason from the world's greatest philosophers and jokes from the backs of matchboxes.

*The Sandman Cometh* is divided into two 48k Spectrum adventures. You are the dreamer searching for clues in a maelstrom of mental turmoil — seeking only the means to wake up. There are quality graphics illustrating most of the stuff that dreams are made of, and a rich vocabulary.

### The Bait

*The Popular Computing Weekly* school of hack psychology and fringe religion invites you to win five copies of the *The Sandman Cometh*. First prize will consist not only of the game itself but also a bottle of vintage champagne!

### What to do

*The Sandman Cometh* is no ordinary program and to win it you'll have to complete no ordinary competition. In each of the next two weeks' issues (December 13 and 20) we will be publishing a rhyming couplet somewhere in *Adventure Helpline*. In the third week — the January 3 issue — we will print a listing for a game that combines a quiz with an adventure. Complete the clues, explore the adventure make use of the enigmatic advice offered in the two rhyming couplets and you'll hear a tune.

### How to enter

If you think you know the tune, name it, with a brief explanation of what you did to discover it (you can't get it just by looking at the listing incidentally) and send the details to Sandman Competition, *Popular Computing Weekly*, 12-13 Little Newport Street, London WCH7PP by 1 February 1985. The first 15 senders of correct entries get the prizes and the editor's decision (as usual) is final.



### ★ A CRASH SMASH ★

► DARK STAR - HAS TO SAY THE LEAST STUNNINGLY FAST AND SMOOTH 3D VECTOR GRAPHICS ■ IT MUST SURELY WIN THE ACCOLADE AS THE FASTEST SPECTRUM GRAPHICS EVER ■

### HOME COMPUTING WEEKLY FIVE STAR RATING

► SUPERB MOVING STAR EFFECTS ■ IT BECAME OBVIOUS THAT THIS WAS SOMETHING SPECIAL ■

### PERSONAL COMPUTING GAMES ★ ★ ★ PCG HIT ★ ★ ★

► I FOUND IT EXCITING AND COMPELLING AND KEPT WANTING TO HAVE JUST ONE MORE GO ■

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RA-TS KPAD

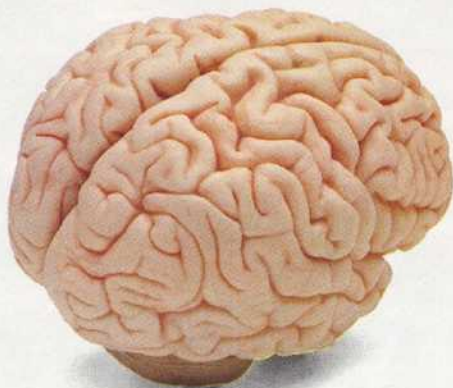
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# Are you only using

To only play games on a Commodore

computer is like asking Albert Einstein to work out

the square root of four.

The computer's brain barely ticks over.

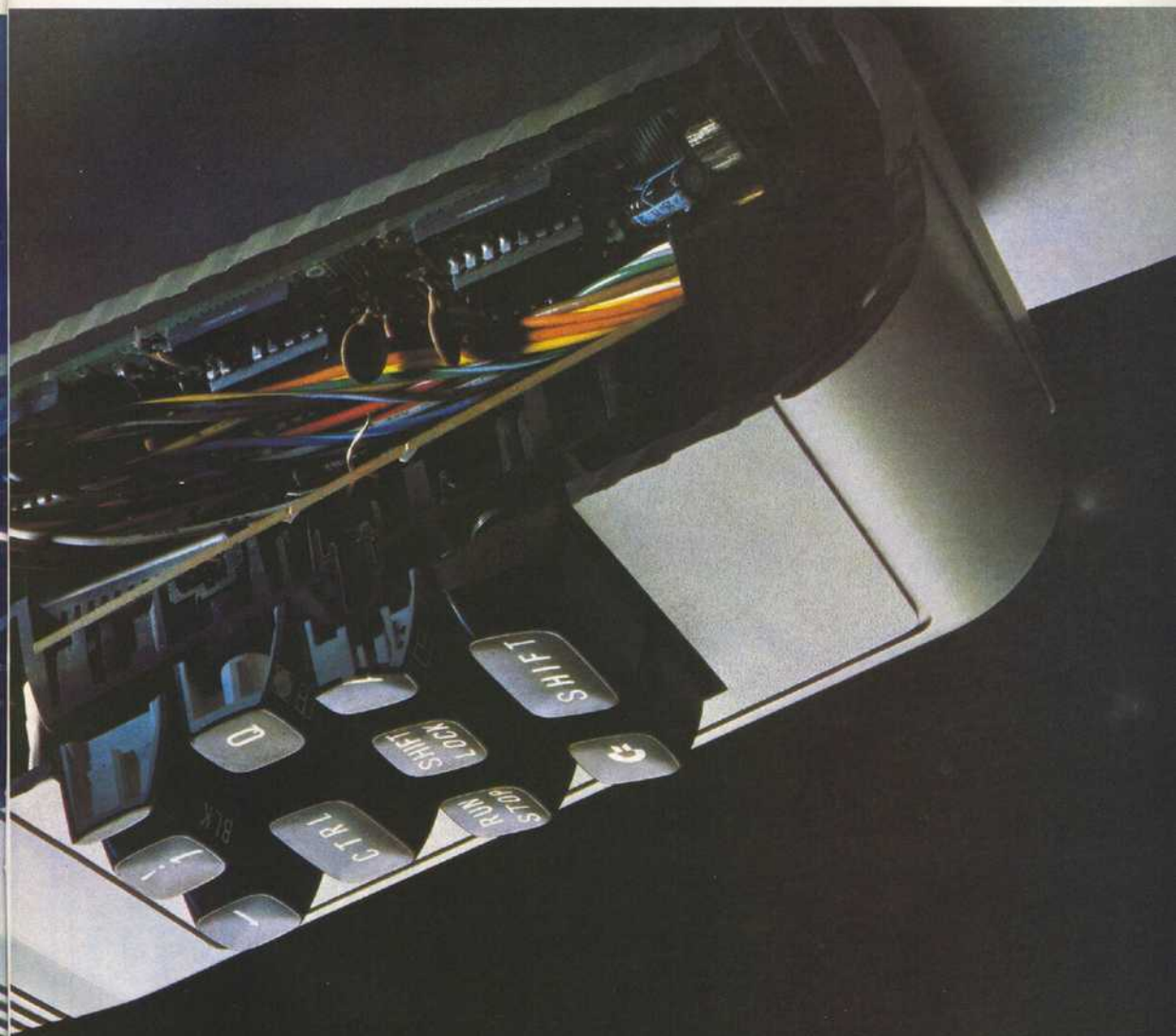
To really stretch it, you need more interesting

software programs. For example, record keeping,

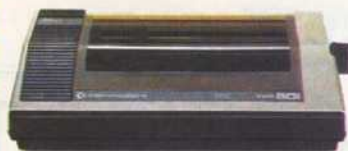
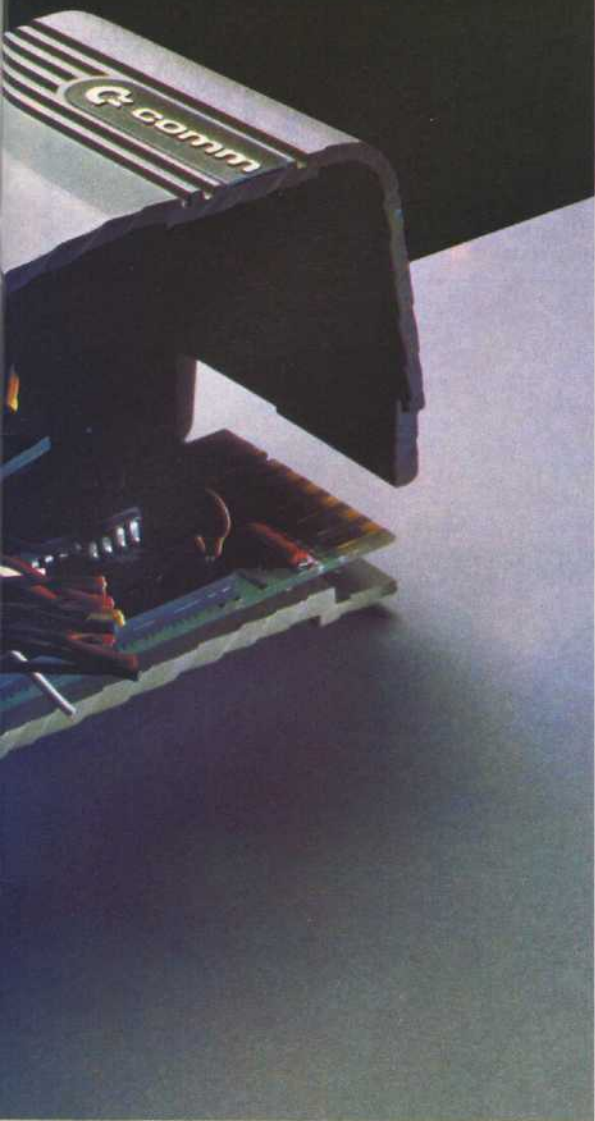
interactive education, stimulating adventure games

or word processing.

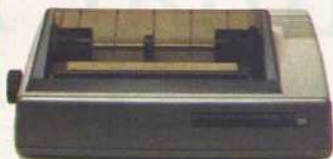
And for those you need peripherals.  
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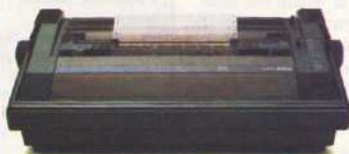




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PEPCY 1:84



**commodore**

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# Lunar Module

Your chance to make that giant leap for mankind on the Dragon 32 by Ashley Watson

## Program Notes

### Lines

10-210

Initialise

Main loop

Check keyboard

Calculate

Delay

Crash/land routines

5000-5140

4000-4050

3000-3100

2000-2050

1000-1120

3030

3090

3030

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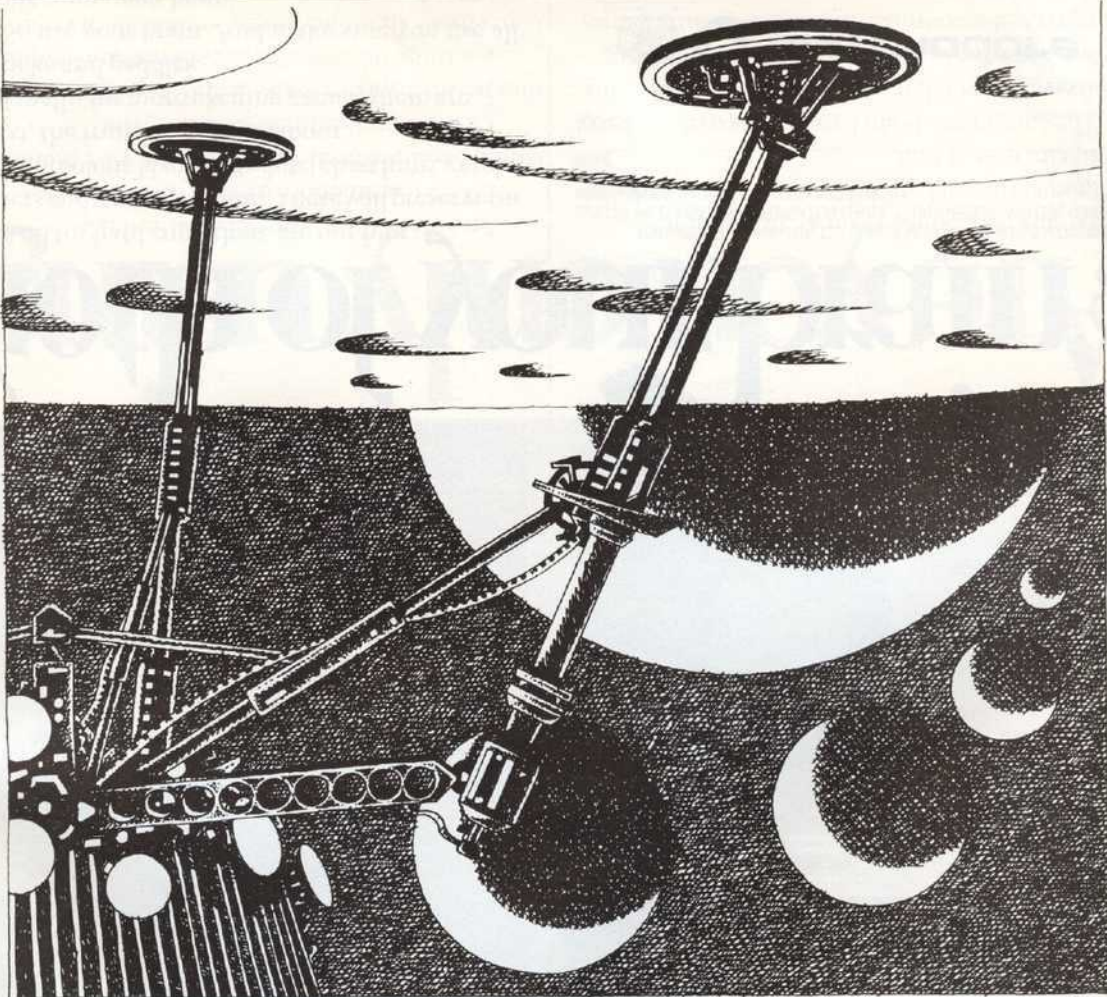
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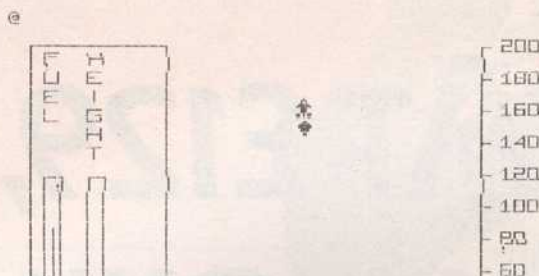


This program simulates the landing of a lunar module on the surface of a planet. The speed at which the craft falls, etc., is quite accurate because a number of equations are used — Lines 3030 to 3090 — which calculate fuel used, fuel left, mass of module, velocity and height above the planet's surface. On a successful landing, the speed at which the landing look place will be shown. Full instructions are shown within the Dragon.

6000-6150 Display instruments  
6150-6250 Print space ship  
7000-7040 Draw landscape  
8000-8130 Instructions  
8500-8560 Another go?  
9000-9300 Used to set up display  
9310-9390 Data for letters, numbers and machine code



THE FOLLOWING IS A SCREEN DUMP OF THE PROGRAM



```

10 REM
20 REM initialise
30 REM
40 CLEAR 100,32700
50 DIMW$(26),NU$(10),R(10),R1(10),R2(10),R3(10)
60 FORA=1 TO 26:READW$(A):NEXT
70 FORA=1 TO 10:READNU$(A):NEXT
80 PCLS:FORA=0 TO 10:READ DA:POKE1536+(A*32),DA:NEXT
90 FORA=0 TO 7:READ DA:POKE1538+(A*32),DA:NEXT
100 FORA=32701 TO 32738:READB:POKEA,B:NEXT
110 GET(16,0)-(24,8),R2,G
120 GET(0,0)-(8,10),R,G
130 GET(100,100)-(108,110),R1,B
140 GET(100,100)-(108,108),R3,G
150 GOSUB 8000:GOSUB9000
160 V1=100
170 H1=1000:H=H1
180 F1=500
190 M1=2500
200 MU$="LB0T80V31AV25BV20CV15D"
210 CR$="01T255L255BAG"
1000 REM
1010 REM main loop
1020 REM
1030 GOSUB 6000
1040 GOSUB 2000
1050 IF H1<1 THEN 5000
1060 GOSUB 3000
1065 IF H1>1000 THEN CLS:PRINT" THE
PLANET IS NOW OUT OF RANGE
DUE TO OVER THRUSTING.
MISSION FAILED":GOTO8500
1070 GOSUB 4000
1080 IF H>=200 AND H1<200 THEN F4=1
ELSE F4=0
1090 IF H<=200 AND H1>200 THEN F5=1
ELSE F5=0
1100 IF F5=1 THEN C=1000:GOSUB 9210
1110 IF F4=1 THEN C=200:GOSUB 9210:GOSUB70
1120 GOTO 1030
2000 REM
2010 REM check keyboard
2020 REM
2030 A$=INKEY$:IFA$=""THEN 2070
2040 J=ASC(A$)
2050 IF J<48 OR J>53 THEN 2070
2060 K=J-48:GOTO2080
2070 K=0
2080 IF F2>0 THEN F=K*10000 ELSE F=0:K=0
2090 RETURN
3000 REM
3010 REM calculate
3020 REM
3030 V=V1:H=H1:F2=F1:M=M1
3040 A=(F/M)-2
3050 V1=V-A
3060 H1=H-V
3070 U=(F/50000)*50
3080 F1=F2-U
3090 M1=M-U
3100 RETURN
4000 REM
4010 REM delay / print thruster
4020 REM
4030 IFK<>0 THEN PLAY MU$:FL=E6+2:FM=
E6+10:PUT(128,FL)-(136,FM),R2,PSET
ELSE FL=
0:FM=0
4040 FORB=1 TO 300:NEXT B
4050 RETURN
5000 REM
5010 REM crash or land
5020 REM
5030 IF V1<5 THEN 5100
5040 REM
5050 REM crash routine
5060 REM
5070 FORQ1=1 TO 13:CIRCLE(130,175),Q1:
PLAY CR$:NEXT Q1
5080 FORQ3=13 TO 1 STEP-1:CIRCLE(130,
175),Q3,0:PLAY CR$:NEXT Q3
5085 CLS:PRINT"YOU CRASHED AT A SPEED OF";Z

```

continued on page 20



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	SINCLAIR SPECTRUM PLUS	ACORN ELECTRON	COMMODORE 64	ATARI 800XL



```

5090 G010 8500
5100 REM
5110 REM land routine
5120 REM
5130 CLS:PRINT"YOU LANDED AT
A SPEED OF";Z
5132 IF Z<0 THEN Z=.1
5135 PRINT"METRES PER SECOND"
5140 G010 8500
6000 REM
6010 REM display instruments
6020 REM
6030 X=INT(F1+.05):Y=INT(H1+.05)
Z=INT(V1+.05)
6040 IFY<0 THEN Y=0
6050 G05UB 6160:G05UB 6070
6060 RETURN
6070 REM
6080 REM update fuel/height level
6090 REM
6100 X=X-.5:Y=Y/12
6110 LINE(39,170)-(39,81),PRESST
6120 LINE(20,170)-(20,81),PRESST
6130 LINE(20,170)-(20,170-X),PSET
6140 LINE(39,170)-(39,170-Y),PSET
6150 RETURN
6160 REM
6170 REM update space ship
6180 REM
6190 EB=E6:E9=E7
6200 IF H1<200 THEN Y8=Y/1.18 ELSE
Y8=Y/5.9
6210 E6=180-Y8:E7=170-Y8
6220 PUT(128,FL)-(136,FM),R3,PSET
6230 PUT(128,EB)-(136,EB),R1,PSET
6240 PUT(128,E6)-(136,E7),R,PSET
6250 RETURN
7000 REM
7010 REM draw landscape
7020 REM
7030 DRAW:BM80,190M+20,-23M+15,+12M+31,
-7M+20,+21
7040 RETURN
8000 REM
8010 REM instructions
8020 REM
8030 CLS
8040 PRINTAB(10):"LUNAR MODULE"
8050 PRINTAB(10):"-----"
8060 PRINT"(C) 2/3/84 BY ASHLEY WATSON"
8070 PRINT
8080 PRINT"YOU ARE IN CONTROL OF ONE OF
THE NEW X-ASH-X ROCKETS AND YOU MUST
LAND YOUR ROCKET ON THE
SURFACE OF THE PLANET ASHTRON."
8090 PRINT"TO SLOW THE ROCKET DOWN USE
THE THRUSTERS (KEYS 1 TO 5 -1 ISWAKE
51) BEFORE THE FUEL RUNS OUT.
TO LAND SUCCESSFULLY THE SPEED MUST
BE BELOW 5 METRES PER SECOND."
8100 PRINT"HEIGHT IS SHOWN ON

```



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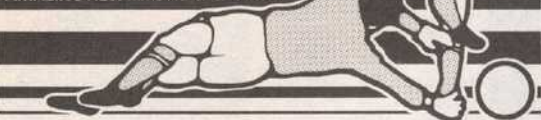


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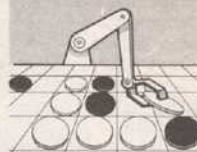
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## Sounds good

Program Se-Ka of Assist

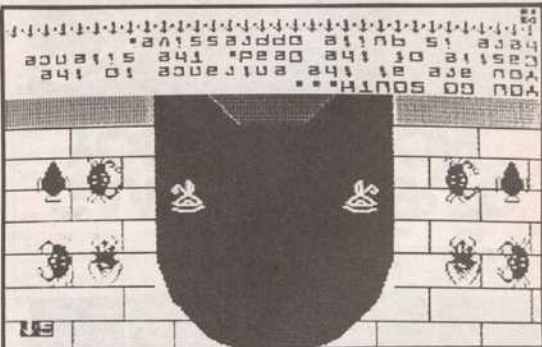
Price £2.99 Micro Spectrum

48K Supplier Master Vision,

Park Lane, 111 Park Road,

London NW8 7JL

There's also far better use of sound than in most adventures (fall off a path and see what I mean). What is lacking is content. With a good number of rooms, all made up of the same elements, a sense of repetition soon sets in. There are too



YOU GO SOUTH...  
YOU ARE AT THE ENTRANCE TO THE  
CASTLE OF THE DEAD. THE SILENCE  
HERE IS PURE OPPRESSIVE.

many empty places — in fact I

was left wondering whether I'd

missed something, but my copy of

Se-Ka came in a video case

with accompanying booklet. It's

an adventure with illustration

or rather it's a mainly illustra-

ted adventure, in two parts.

The first is to find various

sacred objects in the Castle of

the Dead, which is haunted by

the Dark Hordes. These ob-

jects then have to be returned

to their rightful places.

In a week which has produced

many good new adventures,

this one is in some ways, a

disappointment. The illustration

is rather good, with

animated flames on the torches

and a useful compass indicator

at the top of every scene.

## Get your kicks

Program Smash and Grab Mi-

cro Election Price £7.95 Sup-

plier Superior Software, Re-

gent House, Skinner Lane,

Leeds.

Ever fancied robbing a

bank with the know-

ledge you have three

chances of getting away with

millions of pounds? Well, here

is your chance.

You may have three chances

and there may only be one

police-man chasing you, but

there are also floating dustbin

lids and flying police-comes to

confront with.

To explain first you kick a

John Minson

look if you're an absolute ad-

vice and is certainly worth a

rip off and for the price it's no

picture book without a story.

There's no doubt about this

game, but it's all rather like a

gratuitous talent behind this

ware. To be cruelly analytical it

is a ladders and platforms

game — but a first-rate varia-

tion on the theme.

You control (from the key-

board only) Jack's movements

which are fast and well animat-

ed. Climbing the beanstalk is

not as easy as it looks —

grabbing golden eggs and

harp (could Guinness have

been an inspiration?) and

police-cone through a bank

window. This releases bags of

gold which then cascade down

the screen. Your job is to run up

and down ladders and across

platforms collecting the bags

of gold.

A lot of kicking is encourag-

ed in this game. If you aim a

sharp boot at a flashing police

box (one of the old 'Tardis-

shaped sort) the traffic lights

for some reason change to red

and this gives you the chance,

just by touching him, of

knocking the poor bobby into

the water.

In short, a reprehensible

little game — I liked it.

Fred Short

## Harping on

Program Jack and the Beans-

talk Micro BBC B Price £7.95

Supplier Superior Software,

Dept C, Regent House, Skinner

Lane, Leeds

The fairytale of Jack and

his adventures with a

magic beanstalk is the

best game from Superior Soft-

ware. To be cruelly analytical it

is a ladders and platforms

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tion on the theme.

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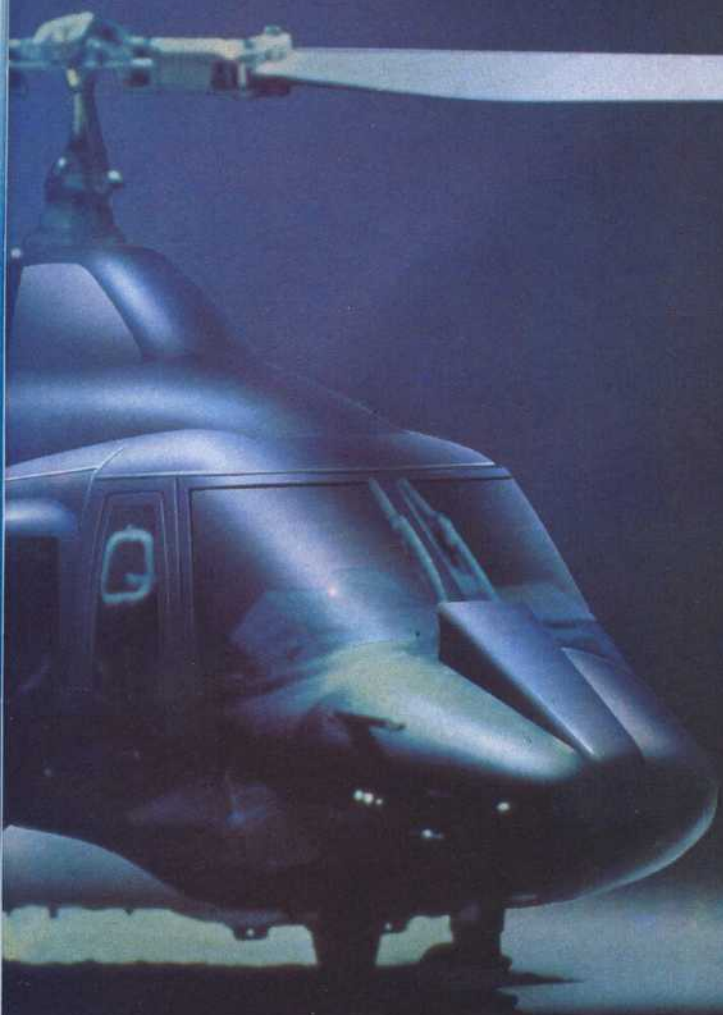
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Add to this the ability to alter the pitch tone and shape of the sound you have produced and it's flexibility is unlimited. In simple terms, imagine the note you have produced as a calm sea, by altering the pitch and shape you can produce waves, the top of the wave corresponds with the maximum volume and pitch of the note, which like the wave itself rises and falls.

## Free Music Designer Cassette Worth £9.95

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The screen display shows all functions. Simply move the cursor along the keyboard, select the desired note by pressing the fire button and the note selected then appears on the screen.

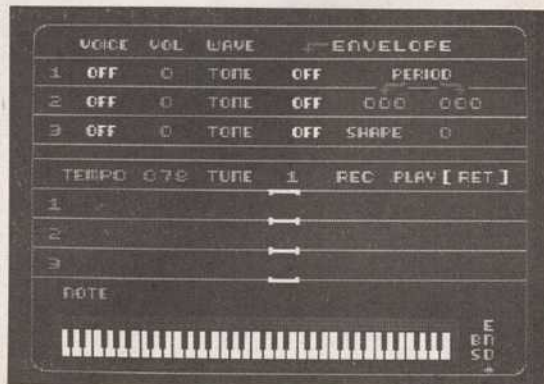
You can vary the tempo/volume and when 'played' the notes simultaneously scroll across the screen. 10 Envelope controls mean that once created, tunes and sounds can be subtly altered given varying attack and decay times to create futuristic music and sound effects. You can record and save up to three different tunes and amend each one as necessary. The dk'tronics Sound Synthesizer is suitable for both Spectrum and Spectrum + models and is guaranteed to give you hours of fun and would make an ideal Christmas gift, you never know you might turn to be another Stevie Wonder.

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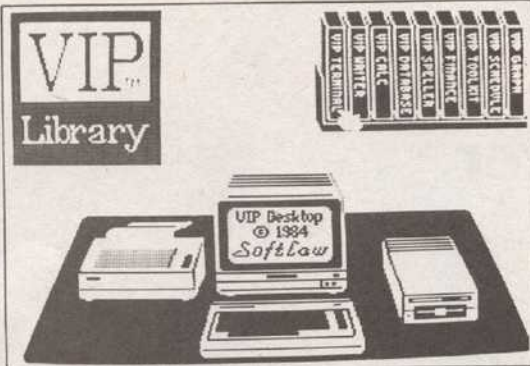
# Reviews

## Advanced

**System** VIP Terminal Micro  
**Commodore 64 Price** £50 on disc  
**Supplier** Impex Designs, Metro House, Second Way, Wembley, Middlesex

**M**odems and the development of phone-in systems seem to be getting a good deal of attention these days. The speeding up of the British Telecom acceptance procedures for modems and the increasing interest of large companies such as Commodore and ICL in the commercial potential of phone-based communications are helping to generate interest. However, we are still somewhat behind the USA in this field and many of the new systems appearing in the UK now are based on American experience.

The VIP Terminal software, developed in Minneapolis, is a good example of the level of sophistication which can be achieved. The package gives nearly all the facilities required to fully exploit phone communications. Nine major functions allow you to set up a wide



range of options: a help facility, a screen display setup, a telephone directory, the communication mode itself, a facility to pre-program short messages on to certain keys, a real-time clock with alarm, disc management and file editing, and a printer-driver routine.

The display can be modified to show 40, 64, 80 or 106 columns of text, in any colour. Of course a monitor is suggested for the highest resolution. Automatic wordwrap can be switched on, and audible margin-warnings can be requested.

The terminal handles baud rates from 50 to 2400, including

split rate 1200/75, assuming that your modem is as versatile. The software gives you full control of such things as parity, stop-bits, duplex, linefeeds, pause characters, the sending of special characters, and so on. All those things which may change from system to system and can cause major problems for the inexperienced or non-technical user, such as myself. It is possible to call for help or modify these settings whilst in the communications mode.

The phone directory lets you keep phone numbers, settings for different systems (such as baud rate), and log-on messages. If you have a suitable

modem you can even get the software to auto-dial and log on for you. Unfortunately this is where the American software is of limited use. Commodore have released a number of modems in the States which are driven by this software, but many modems sold in the UK do not use the same method for auto-dialling.

The disc commands let you set up files on disc, modify files, send stored files through the modem, and receive and store files. Non-Commodore printers as well as the various types of Commodore printer are allowed for to produce a hard-copy of your communications.

The VIP Terminal is a very advanced package, giving facilities and a level of control usually reserved for business micros. The cost takes the software out of the games-software league, and deservedly so. A pity that the auto-dial may only be used by some, although most modems (thanks to BT) do not support this facility in any case. Incidentally the software cannot be used to drive the Compunet modem, nor can it be used to give full access to Compunet.

John Cochrane



## Deuce

**Program** Match Point  
**Price** £7.95  
**Micro** Commodore 64  
**Supplier** Psion Limited, 22 Dorset Square, London NW1.

**H**ow about this for a last-minute contender for the Christmas No 1 slot? Psion — better known for its Sinclair titles — has produced its first ever program for the

Commodore 64, a conversion of its excellent Spectrum release *Match Point*, the tennis simulation to beat all tennis simulations.

So many Spectrum to Commodore conversions turn out to be disappointing — *Match Point* is a welcome exception. It all bodes well right from the speedy loading, followed by the title screen depicting a hunky specimen of the tennis fraternity.

As you might expect, the

graphics are bolder, even more life-like than the original, as the players skedaddle round the court on little legs at a great rate.

Choose from three speeds of play according to ability and how much you want to trash the computer at its own game. The quarter final's speed is good for starting off with to enable you to work out how best to play the shots. Semi-final pace gives a good playable game, while the finals will soon have you reaching for the sweatband and umpire's refreshments yourself.

Almost as much fun as playing is watching two players battle it out in demo mode — no tantrums over dubious line calls here, and the Commodore crowd are a passive lot too — they don't turn their heads to follow the ball as they did on the Spectrum.

Three final points worth mentioning: the game is joystick controlled only, the blurb on the inlay says to abort a

match and return to the main menu press F1, whereas on my copy F2 did the trick, and if you press the space bar while serving, you can watch the receiver jiggle about on the baseline. Just like real life.

Christina Erskine

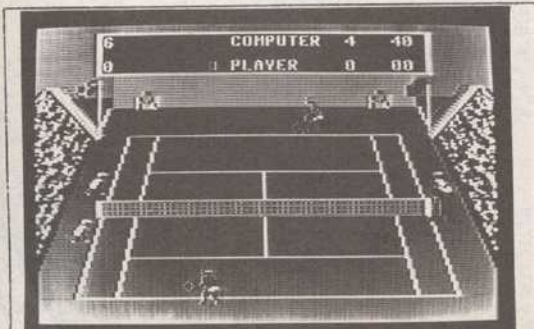


time to complete each task.

Given this element of competition it seems unfair not to be display either score or time counting down. I think most children will feel cheated to suddenly find that the mirror 'shatters' because time has expired. And the use of the cursor keys is bad for little hands — why not user-definable ones?

Given these rather major reservations, the game should serve its purpose providing there is suitable parental supervision, something the booklet emphasises.

John Minson





# tír na nòg



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"Some were named after daughters of the floor workers."

The final operation to take place in the body construction area is quality control. Before leaving in an elevator for the first floor to have the doors and boot lids fitted, the underbody is placed on a large pressure sensitive 'bed'. Electronic sensors connected to a Hewlett-Packard computer check the position of each specific component. The charts produced from the computer immediately show if anything has been finished incorrectly — even a millimetre out of alignment can be detected.



Dave Hutchinson

The robots do not stop here with the assembly of the main body — the paint shop is also now fully automated too.

First the entire body frames are cleaned, degreased, electro-coated — to prevent corrosion — sealed at the joints, and cleaned again, to remove any lingering dirt or dust. Surprisingly, here the final cleaning is done using ostrich feathers. Robot ostriches? Apparently not.

Ostrich feathers are expensive, but last about a year before they need replacing. Their electrostatic properties make them the best for the job — far better than the plastic strips used in an automatic car wash.

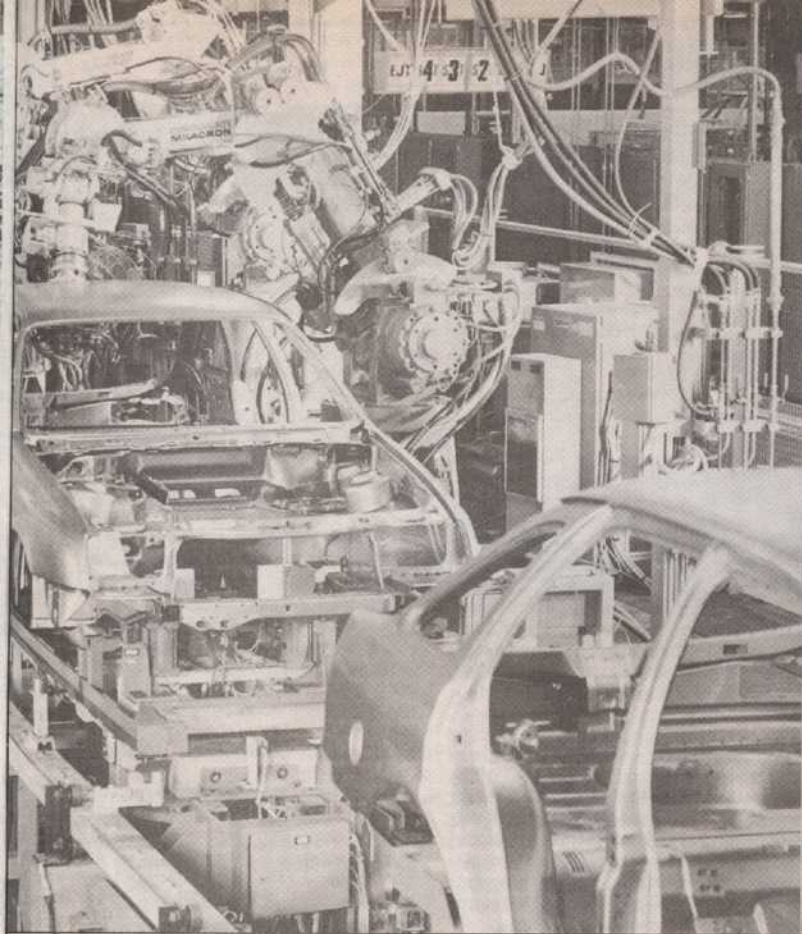
The robots are allowed the last word though — they apply each of the seven coats of paint applied to the Sierra models.

The Sierra assembly line in the Dagenham plant is the most technologically advanced in the country. The cost of all the robots now installed on the line amounts to some £250m.

"We went by the robot route to save on constant labour costs and become more efficient," said Dave. "Obviously though we still need the staff to supervise and maintain the robots."

The question of how the robots have taken over from manpower is inevitably a touchy one. In the 1970s — pre-robot days — there were about 50 people working on side-frame assembly alone. Today that number has been whittled down to a fifth. And robots don't have salaries and paid holidays.

Ford maintains that such automation has had to be introduced in order for the company to remain competitive.



frame is constructed.

With the underbody, Kuka robots are again used for spot welding. "These are what we call hard automation robots, because they can't be reprogrammed," said Dave.

"The Kukas you saw on the side assembly are all reprogrammable — you can alter the speed at which they work, the number of spot welds they make, and so on. A separate hand-controlled unit can be plugged in, and the new motions gone through, physically, using the unit. Then you press a button, and the movements are stored in the robot's memory. The new programs are generally stored on tape and two back-up copies made.

"However, the underbody construction is all done with hard automation — the main panel is loaded in at the start, the rear and front floors and engine compartment are then spot welded on to complete the assembly. An electronic signal is also sent to the underbody assembly section to determine whether the components are to be set up for a left-hand or right-hand drive car.

"Automatic transfer devices, similar to the Niko 'hand' pick up the completed underbody — the part we call the 'marriage' — and bring it together with the side frames for the main body-frame assembly.

"The main body-frame assembly is still done by hand," admitted Dave. "We simply haven't found a better way yet. The staff on this line use simple clips to attach the roof panels, each side panel and the underbodies together."

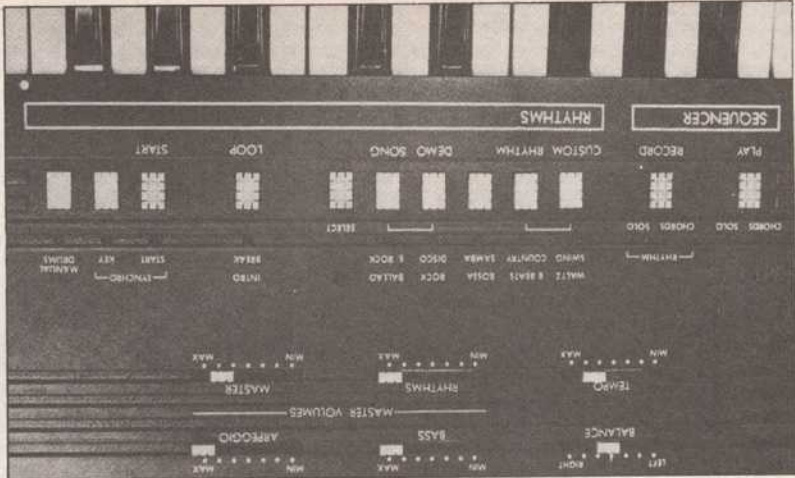
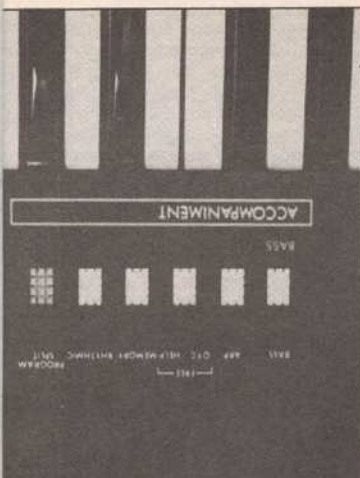
Next the assembled Sierra bodies begin their trip down the long line of bulky Cincinnati robots to finally weld the frames together.

The 24 Cincinnati robots which finish off the welding are the most powerful. Standing about six feet high their precise movement is controlled by computer-operated hydraulic pistons and activators — rather than by electric motors. Whereas the spot-welding and clipping, up till now, has only involved the minimum number of connectors and robot movements to hold the frames together at this section of the line, the Cincinnati giants provide the main strength welding finish.

They were among the first robots to be used by Ford and are the only ones at Dagenham to have been given names — two are called Sarah and Anne and those on the second line are called after football teams — West Ham, Arsenal and Fulham.

Intrigued, I had to ask. "It was one way of making the robots seem less threatening when they were installed," Dave explained.





ment sounds and so on. There are two ways of looking at the Siel MK900, as an instrument in its own right and as a computer controlled MIDI keyboard. This being a computer magazine, we'll zoom through the former and look at the latter in more detail.

What you get for £449 is a five octave full size keyboard with ten preset sounds, ten rhythms, a sequencer which can remember 50 chords and 280 notes and various autoaccompaniment features.

A feature which enables two presets to be played at once on the same note makes Even of the basic sounds pretty impressive. Even the latest, the Piano preset, as is often the case, can be improved by sustain and

detune features. The rhythm section is good. Digital clicks usually associated with built-in drum units. There is also the facility to create your own rhythms guided by a metronome pulse — very effective and useful.

Any of the features may be recorded into the sequencer and will loop round endlessly to provide a simple backing for solos. All in all, it is the elder brother to all those little Casio keyboards, incorporating many of the same features, a few of the limitations, but mostly having much more impressive

sounds and rhythm units. But the MK900 has MIDI and as such can be linked to a home computer via Siel's two interface unit (£89) and controlled by computer software — at present there are two packages for the Commodore and one for the Spectrum. A BBC MIDI interface is due as is some BBC software.

I looked particularly at Siel's two packages for the Commodore — the *Multitrack Composer* and the *Live Sequencer*. The *Composer* is some way towards the on-screen musical score but it uses musical notation which is clearly intended for computer novices rather than experienced musicians. In other words you don't get staves, crochets and quavers. Instead,

sections of music can be rearranged. With instant playback of one or all parts. One case, (do) allow for multi-part compositions. Software packages can (and, in at least typists previously accustomed to writers and keyboard allows a freedom similar to that provided by wordprocessors to writers and

For musicians finding a computer to a allow you to continue. understand some musical point before — the computer can ensure that you can cover those areas you are most doubtful about in greater detail and at greater length. You get more flexibility in the sense that you control with a computer in absolute terms.

For educational purposes you get more control with a computer in absolute terms. For educational purposes you get more control with a computer in absolute terms. For educational purposes you get more control with a computer in absolute terms. For educational purposes you get more control with a computer in absolute terms. For educational purposes you get more control with a computer in absolute terms.

All this easy-play technology wasn't totally unsuccessfull, but the inherent inflexibility of the system meant that the end results sounded like the kind of skill-numbing music you hear in hypermarkets whilst shopping. What a computer can provide is the flexibility that was originally lacking. Using computer programs to learn about music will always be more successful than flashing beds or instant chords (unless it is absolutely horrendously written, which has too often been the case until recently) because it requires your response and control with a computer in absolute terms.

know that the real money is not made from professional musicians but rather from dabblers, amateurs who know a little music MK900, as an instrument in its own right and as a computer controlled MIDI keyboard.

as easy to play as possible. Casio and co. musical keyboards have spent much time, effort and money making those instruments look at the other side of the coin.

Why not just buy the instrument? Time to argument, why involve the computer at all? But whilst all this is a pro-synthesiser

simple chords. means, basically, that you cannot even play best, four channels of sound. This last point computers are capable of only three or, at difference, sound chips on available instruments that is often difficult to tell the capable of such perfect mimicry of acoustic The synthesiser on the market now are board with any finesse — but also in terms mically — you can't play a Qwerty key- never otherwise possesses. Not only ergono computers musical possibilities they could

A synthesiser can give the current crop of pen. common a peripheral as a joystick or light the way to the time when a synthesiser is as more than a good printer. It's a big step on keyboard for just over £400 — not much

However, the new Siel MK900 is a MIDI equipped keyboard has been £700 at least. music. Until recently the cheap MIDI too expensive, whatever their interest in so far the jump into MIDI has simply been The problem for computer owners is, that computer music development.

the spark which ignites a whole new area of different manufacturers, looks like being them to connect together instruments from standard for musicians, enabling What began as a long overdue

Much has been said of MIDI recently. Hardware Siel MK900 Price £499 (MIDI interface £39, Software £30 approx) Supplier Siel UK, Alford Depot, Reigate Road, Hookwood, Horley, Surrey.

Performing Siel



# Hardware Review



notes are notated with their letter and a number to indicate which octave you require, eg, C4 equals C in the fourth octave. The = and the \$ sign are used to indicate sharp and flat respectively. Note length is expressed as fractions of 96, so a quarter note has a duration of 96/4, ie, 24.

Tunes are created on one of six tracks (like a single line of monophonic, ie, single note music) which are then assigned to Midi channels. More than one track may be assigned to each Midi channel and in this way chords may be created using combined single tracks together.

Individual notes may be made staccato or legato by adjusting the 'gate on time' figure — basically slightly adjusting this figure makes the note a little longer or shorter without affecting the 'clock'.

Each track of music may be edited — notes may be removed, added, note lengths changed and so on, tracks may be saved to disc, loaded in, renamed or erased under your command. What does this mean in terms of the MK900?

The keyboard has two Midi channels: 0 and 1. This means that it can have two 'streams of information' operating independently at the same time. If that sounds confusing it isn't, since in practice two Midi channels means that at any given moment two sounds may be used and within each sound the six tracks may be allotted. For example, by assigning tracks one to four to Midi 0 and tracks 5 and 6 to Midi 1 you have set up an arrangement whereby one sound (say, organ) can play chords, up to four notes and the other sound (say, synth) can play up to two notes on a lead line. I should add that whilst the computer is playing the keyboard you can still join in, using the same sounds.

On the Commodore you are provided with a total of 9000 notes to play around with, 1833 over the six channels, enough for anything short of *The Ring Cycle*. The C4,B3=, D5 notation is obviously pretty irksome to tap into the keyboard but if, like me, your musical compositions don't get much beyond three note chords and one

note lead lines it shouldn't be too much of a problem.

The live sequencer is, in a way, the Composer from the other end. Here you set up the program to receive information and play the keyboard. The border flashes as each note is 'received' by the computer, although all that is recorded is the note information, not the particular tone you have set — you can change that as you wish.

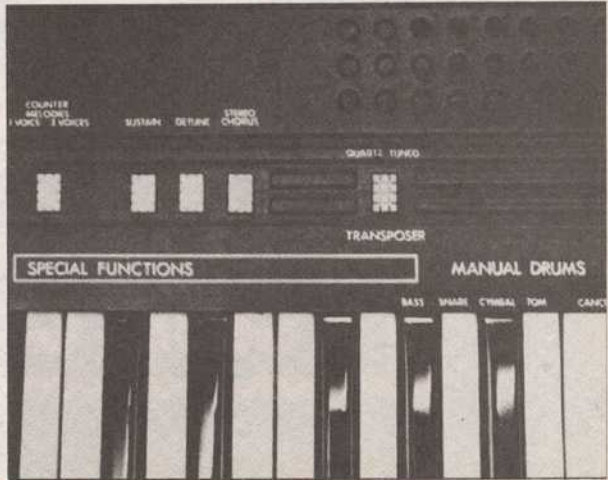
The recorded notes are assigned to a given track and may be played back through the keyboard at a faster or slower speed. New tracks may be recorded and also played back — the effect is very much like having a multi-channel tape recorder with extensive over-dub facilities.

Obviously entering the music with the keyboard is much more convenient than typing in the notes on the Commodore but then you don't get the same degree of editing flexibility. You pay your money... etc, etc. The MK900 is a high quality top-of-the-range portable with enough features and quality sounds to get music that doesn't sound bad with only a little effort. Add a Midi interface and you have, with the right software, an instrument on which you can compose multi-part music, create and replay many lines of melody and generally tinker to your heart's content.

The MK900 lacks two things; firstly it has presets and thus the sound creation is limited and secondly the Midi standard allows for the communication of velocity (how hard you hit the keyboard) but the MK900 is not a velocity sensitive keyboard. In this sense, buying the MK900 is not letting you use all the Midi features possible.

For my money the MK900 is the ideal instrument for those who want a starting point with computer music but aren't too worried about limited sounds and don't want to risk too much money. The auto features are particularly useful and with the software packages that will surely come, sophisticated and impressive arrangements can be created.

**Graham Taylor**





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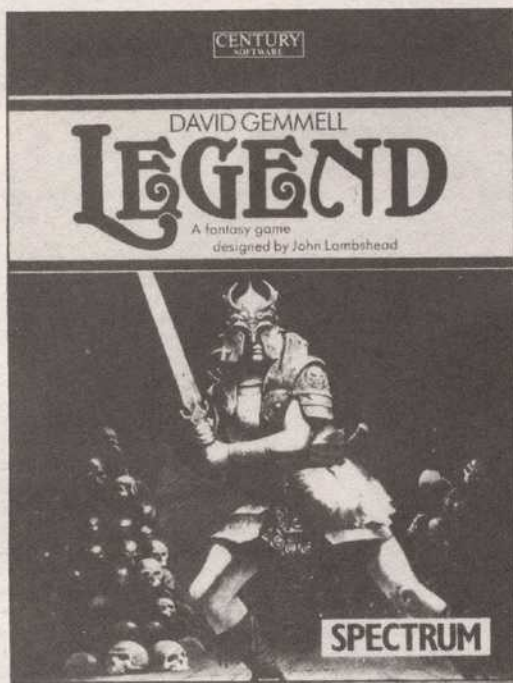
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## Compatible

**Hardware Saga I Emperor Micro**  
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Road, Woking, Surrey.

board never actually touch the ground. I also found the key layout a bit unbalanced with almost all the new keys bunched on the left hand side. This is something you soon get used to.

Assembly of the new board is as simple as the built-in claim, involving only the removal of five screws and the two ribbon connectors of the Spectrum board and replacing them with about eight new screws, the new ribbons and a small clip on the interface. However, the whole system is let down by very poor documentation, which only makes sense once you have figured out for yourself how the thing must go together. It is also complicated by the inclusion of a few extra mystery screws and clips which I assume are for the other Saga peripherals, such as a sound amplifier that fits inside the case.

However, these are only minor criticisms and they shouldn't put you off. On the contrary, this is not only the most elegantly designed and styled add-on board for the Spectrum yet, but it is also firmly constructed and an absolute joy to use. The keys themselves have a very positive feel and the layout is on the whole very good with a nice big space bar and two large

I has always annoyed me that so called 'professional' keyboards for the Spectrum have fallen short of anything that could really be used to obtain respectable typing speeds. Admittedly this is primarily the fault of the hopeless double shift and extended modes of the keyboard entry system. These present manufacturers with endless headaches if they want to provide a board that allows one keypress access to the various punctuation marks. As I understand it, Sinclair themselves had to resort to special arms within the Spectrum + that physically depress different parts of the membrane to obtain the extra keys such as the semi-colon. On first opening the box of the Saga I, I dared to hope that someone else had finally come up with a mechanism for doing the same, as most of the punctuation marks are represented on their own as well as selected functions such as *Edit* and *Delete* that can only be accessed using the shift keys. Disappointingly the system they have used in fact only comes halfway to providing these features as they are no more than relabelled copies of the original key and return the unshifted signal when pressed alone.

The idea is that it is easier to spot and use the most common functions and Saga have provided no less than two cap shifts and four (count them) symbol shifts at useful points all over the board. After some compromise and makes the use of the keyboard faster and more pleasant. Keys also exist for the unshifted functions *Run*, *Load*, *List*, *Save* and *Cts*. Here are also extra cursors in some extremely sensible positions on the board which unlike the Spectrum +, return the numbers 5-8 when unshifted so they will be fully compatible with all existing software.

Some aspects of the design are irritating. The colour coding on the keys is inconsistent, with symbol shifted functions being represented in various places in black, red and green. This is not made easier by the fact that the various keywords on the main Qwerty area are very hard to read, being much smaller than on the original Spectrum which uses the area above and below the keys to carry a lot of information. Perhaps to allow all the various interfaces to be connected, the bottom of the Spectrum board is actually screwed on beneath the Saga, a system that works much better than I expected even though it does leave a gaping hole around the edge connector. However, this does mean that four rubber feet provided at the bottom of the new

## Professional

**Hardware Datafax Disc Interface**  
Micro Sinclair Spectrum Price  
£56.25 Supplier Stacom Distribution Ltd, 18 Grove Road, Sutton, Surrey

Some months back it seemed as if a whole bunch of disc interfaces were about to be launched for the Sinclair Spectrum. Very few of them actually saw the light of day, partly because of micro-drives and partly because the Spectrum was not designed around a disc operating system.



The Datafax interface, consisting of a strongly-built and quite long black box, is the latest attempt to get around this problem. Designed initially to run with a single

## Tony Kendle

Enter keys. I think it knocks spots off the competition.



3-inch Hitachi-based drive (available from the same distributors for around £200, although ask them about an all-in-one price) the interface can be used with 3, 3.5, and 5.25 inch drives. A very simple operating system has been developed which allows you to load and save programs, data arrays, and machine code. The only other facilities provided are to format new discs, to list a disc directory, to erase a saved file, and to make a backup copy of a whole disc.

By keeping the system this simple, the Datafax designers have managed to produce a very useable device which offers high-speed and high-reliability loading and saving without the need to learn a complex new way of using your computer. The interface offers a total capacity of just over 100K per disc side, although work is in hand to operate two drives and to increase the storage per drive. This 100K can be divided between up to 39 separate files. But what about compatibility with existing hardware and software? In principle all hardware is compatible although this is achieved by the simple expedient of providing a hardware switch to control the expansion port provided. Thus you can expand a hardware switch to control the interface between, say, joysticks and disc, but you cannot have them both at once. Most software can also be used, including programs which use nearly all the normal Spectrum memory. This is because the interface permits its own software (which normally uses some of the free Ram) to be overwritten. A special loading procedure allows you to pack in the largest of programs, although you lose the screen display in the process.

John Cochrane



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# Filed, sealed and delivered

A useful filing program for Dragon 32 users written by W Patton

This is a program that allows you write your own filing system and have as many fields to a file as you want. It takes up 1.5K of memory and can store up to 300 entries.

The program is split up into several sections; Line 10 prints out the menu, Lines 20 and 30 get your command to go to the corresponding section of the program. Lines 40-90 are used by Option 1 where you are requested to type in the number of fields that the file you are creating requires. You then type in each entry, pressing *Enter* after each field has been typed in. When you want to finish typing, you must type 'XX' as the first entry to your last file.

Lines 100-110 are used by Option 2. These allow you to add more files to the end of your file. You enter data for this the same way as for Option 1 using 'XX' to return to the menu.

Line 120 is used by Option 3 and can be used to correct any mistakes made while entering your data. You are required to first state the file that the error is in, then the field. You then type in the new item and it will replace the old one.

Lines 130 and 140 are used by Option 4. This allows you to insert a file anywhere in the large file. You must type in the number at which you want the file to go in at, then you must type in the new file. Line 150 is used by Option 5. You must type in the number of the file that is to be deleted then that file will be erased.

Line 160 is used by Option 6 where the file is saved. You have to type in the name you want to call the file. After pressing *Enter* you are given a pause in which time you should press play and record on your cassette recorder. Line 170 is used by Option 7; the loading routine. You have to type in the name of the file to be loaded. When the file has loaded you return back to the menu.

Lines 180-200 are used by Option 8; the print out routine. You are first asked if you wish it to go to the screen or the printer. Press any key to step through the file. When all the file is printed out the program waits for you to press *Enter* before returning to the menu. Lines 210-230 are used by Option 9, where a word is searched for in the file. You just type in the word you are looking for in full, and the computer will search through the large file until it finds it.

## Variables

A	= Number of fields
Array AS	= All of the file
EO	= Length of file + 1 in memory
XS	= General input
A1	= Value of key pressed
F/X	= For next loop variables
NS	= Name of file to load or save
D	= General input

```

5 CLEAR 10000
10 CLS:PRINT"(1) START A NEW FILE":PRINT"(2) A
DD TO A FILE":PRINT"(3) EDIT A FILE":PRINT"(4)
INSERT A FILE":PRINT"(5) DELETE A FILE":PRINT
"(6) SAVE FILE":PRINT"(7) LOAD A FILE":PRINT"(
8) PRINT OUT FILE":PRINT"(9) SEARCH FOR A WORD
":PRINT"COMMAND"
20 XS=INKEY$:IF XS="" THEN 20 ELSE A1=VAL(XS):
IF A1<1 OR A1>9 THEN GOTO 10
30 ON A1 GOTO 40,100,120,130,150,160,170,180,2
10
40 CLEAR:INPUT"HOW MANY FIELDS";A:IF A<0 OR A>
11 THEN 40 ELSE DIM AS(300,A)
50 PRINT"TYPE 'XX' TO END"
60 FOR F=1 TO 300:PRINT"FILE ";F:FOR X=1 TO A
70 INPUT AS(F,X):NEXT X
80 IF AS(F,1)="XX" THEN EO=F:GOTO 10 ELSE NEXT
F
90 PRINT"FILE FULL":GOTO 10
100 FOR F=EO TO 300:PRINT"FILE ";F:FOR X=1 TO
A
110 GOTO 70
120 INPUT"WHICH FILE";F:INPUT"WHICH FIELD";X:1
NPUT"TYPE IN NEW ENTRY";AS(F,X):GOTO 10
130 INPUT"WHERE IS NEW FILE TO GO";D:IF D>=EO
THEN GOTO 10 ELSE FOR F=EO TO D-1 STEP -1:FOR
X=1 TO A:AS(F+1,X)=AS(F,X):NEXT X,F
140 EO=EO+1:PRINT"TYPE IN NEW FILE":FOR X=1 TO
A:INPUTAS(D,X):NEXT:GOTO 10
150 INPUT"WHICH FILE IS TOP DELETED";D: IF D>=
EO THEN GOTO 10 ELSE FOR F=D TO EO:FOR X=1 TO
A:AS(F,X)=AS(F+1,X):NEXT X,F:EO=EO-1:GOTO 10
160 INPUT"NAME TO SAVE FILE UNDER";NS:PRINT"PR
ESS PLAY AND RECORD":FOR F=1 TO 1000:NEXT:OPEN
"0",#-1,NS:PRINT#-1,EO,A:FOR F=1 TO EO:FOR X=1
TO A:PRINT#-1,AS(F,X):NEXT X,F:CLOSE#-1:GOTO
10
170 INPUT"NAME OF FILE TO BE LOADED";NS:PRINT"
PRESS PLAY CASSETTE":OPEN"1",#-1,NS:INPUT#-1,E
O,A:FOR F=1 TO EO:FOR X=1 TO A:INPUT#-1,AS(F,X
):NEXT X,F:CLOSE#-1:GOTO 10
180 INPUT"(S)CREEN OR (P)RINTER";XS:IF XS="P"
THEN D=-2 ELSE D=0
190 FOR F=1 TO EO-1:PRINT#D,F:FOR X=1 TO A:PR
INT#D,AS(F,X);" ";NEXT
200 IF INKEY$="" THEN 200 ELSE PRINT#D:NEXT:IN
PUT"ENTER TO RETURN";X:GOTO 10
210 INPUT"TYPE IN WORD";XS:FOR F=1 TO EO:FOR X
=1 TO A:IF AS(F,X)=XS THEN 230 ELSE NEXT X,F
220 PRINT"WORD IS NOT THERE":INPUT"ENTER TO RE
TURN";X:GOTO 10
230 PRINTF:FOR X=1 TO A:PRINTAS(F,X);" ";NEX
TX:PRINT:INPUT"PRESS ENTER TO RETURN";X:GOTO 10

```



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## In the parallel universe

Perfect Parallel Printing on the Commodore 64 courtesy of Adrian Warman

As many users of Commodore equipment will be aware, little provision is made for those who wish to use non-standard equipment, such as Centronics-equipped printers. A growth market for CBM users is the Parallel Printer interface package, which can range from cheap cable and minimal software, up to expensive hardware add-ons that do everything and cost a corresponding amount.

A typical software interface will come with a short cable to connect from the User Port to the Centronics Printer, and a small piece of machine code software. This software will usually reside in the spare Ram from \$C000 to \$CFFF, since this is untouched by Basic. Modifications are made to the Kernel vectors so that any attempt to access a given device number (say six) will be re-directed out of the User Port as a parallel *Ascii* code.

Unfortunately, another growth market, extending the Basic on the CBM 64, also tends to produce packages which *also* use the \$C000 Ram. Such a package is the Simons' Basic cartridge, which uses the Ram for a variety of purposes, including Function Key definition. This means that if you want to have a worthwhile language, you may well be unable to use your Parallel Interface Program.

This article lists and describes a reasonably short Basic package which will drive a parallel interface, as long as you have a suitable connecting cable. The routines are detailed, and could be easily converted for use under other languages. For example, the extremely comprehensive Pascal Compiler from Oxford Computer Systems does not support parallel printers, so using the listed routines it is an easy job to define suitable procedures in Pascal to perform all necessary tasks.

The routines supplied are a little slower than machine code equivalents, and they do not check to ensure that the device is present and connected; however, they don't require any of the file channels, leaving them all free for other purposes.

The package consists of three subroutines. One is used to configure the CBM Input/Output chips to control the data lines. The next is used to place an *Ascii* character onto the data lines (and hence send it to any listening device). It will then wait for an acknowledgement that the character has been received. The last routine will restore the CBM I/O chips to prevent the parallel device being accessed further.

As an example of the routines used, a short program is added to the front of the listing which prints out the *Ascii* characters

from number 32 to number 127 inclusive.

### Program notes

Line 140

This line calls the subroutine which will perform the equivalent of Basic 'OPEN' instruction. Since no 'file' is being used, no file number needs to be given.

Line 150

This is the start of the loop to print out the *Ascii* characters from 32 to 127 inclusive.

Line 160

The subroutine to output characters assumes that the *Ascii* code is stored in variable *CHAR*. If you wanted to use literal characters, you could use something like: *Char = Asc ("a")*.

Line 170

This line calls the subroutine which will perform the equivalent of a Basic *Print#x, Chr\$(y)* instruction. Note that (as stated above) no file is used, and so no file number is required. In addition, the semicolon after the print instruction is always implied. Thus, to simulate a

continued on page 51

### 100 REM BASIC PARALLEL PRINTER ROUTINES.

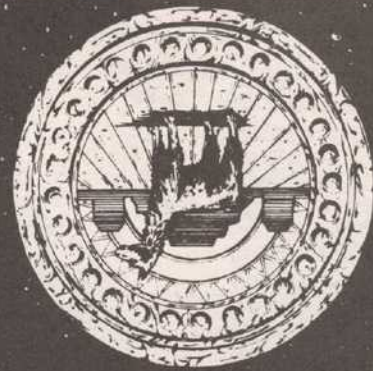
```
110 :
120 REM BY A. WARMAN
130 :
140 GOSUB 60010
150 FOR X=32 TO 127
160 CHAR=X
170 GOSUB 60190
180 NEXT X
190 CHAR=13
200 GOSUB 60190
210 GOSUB 60110
220 STOP
230 :
60000 REM OPEN TO PRINTER.
60010 CIA2=56576
60020 POKE CIA2+3,255
60030 POKE CIA2+1,0
60040 POKE CIA2+2,PEEK(CIA2+2) OR 4
60050 POKE CIA,PEEK(CIA2) OR 4
60060 POKE CIA2+13,16
```

```
60070 RETURN
60080 :
60090 :
60100 REM CLOSE ACCESS TO PRINTER.
60110 CIA2=56576
60120 POKE CIA2+13,0
60130 POKE CIA2+3,0
60140 POKE CIA2+2,PEEK(CIA2+2)
AND 251
60150 RETURN
60160 :
60170 :
60180 REM PRINT OUT CHARACTER
'CHAR'.
60190 CIA2=56576
60200 POKE 49152,PEEK(CIA2+13)
60210 POKE CIA2+1,CHAR
60220 POKE CIA2,PEEK(CIA2) AND 251
60230 POKE CIA2,PEEK(CIA2) OR 4
60240 IF (PEEK(CIA2+13) AND 16)=0
THEN GOTO 60240
60250 RETURN
```



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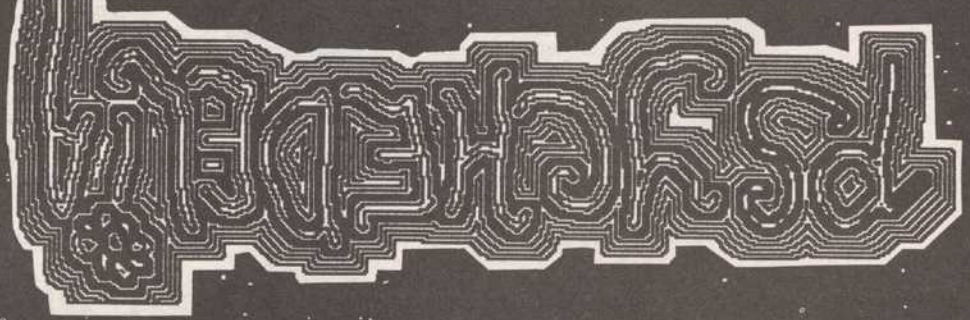
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# Commodore 64

*Print#x* instruction (which would simply print a carriage return), you should use: *Char = 13:Gosub 60190*.

**Line 180** Go and do the next character (if there is one to do).

**Lines 190-200** Output an *Ascii* carriage return <CR> character. This corresponds to the *Print#x* as described above, and on most parallel printers ensures that any text left in the input buffer will be printed.

**Line 210** This line calls the subroutine which will prevent the I/O chips from trying to access any parallel devices on the User Port, by restoring default values. Halt the demonstration program.

**Lines 60010 - 70** These lines are responsible for configuring the I/O chips to access the User Port in a manner suitable for controlling a parallel Centronics device. In its absolute minimum configuration, a parallel Centronics port requires eight data lines (called a 'bus'), a *strobe* line to show the parallel

device when the data on the bus is valid, and an *acknly* line to show when the parallel device has accepted the data. The 8-bit bus is set up using Port B of *CIA#2*, which connects directly to the User Port (program lines 60020-60030). The *strobe* line is bit two of Port A (program lines 60040-60050). Finally, the *acknly* line is set up using the *Flag* interrupt on *CIA#2* (program line 60060).

**Lines 60010 - 140** These lines deselect the I/O chips to prevent them accessing the parallel device. The *acknly* line is disabled so that it can no longer be read (program line 60120). Each of the 8 lines on the data bus is restored to an input line (program line 60130). Finally, the *strobe* line is redefined as an input line (program line 60140).

**Lines 60190 - 250** The key lines of the package. First, a read of the *acknly* line must be made, in order to check it later (program line 60200) — for the reason, see the Programmers Reference

Guide. Note that the data returned is placed in location 49152 simple for convenience! If you wish, you could replace program line 60200 with (say): *Let A = Peek (CIA2+13)*.

Next, the actual *Ascii* code is placed on the data bus (program line 60210). The *strobe* line is switched to show data ready (lines 60220-60230). Since the device may have a delay (such as moving the print head back to the next line), the program must wait for an acknowledgement via the *acknly* line (program line 60240). Once this has been completed, the character has been sent and received, so we can exit the routine.

Hopefully, you should now see how to modify your own programs in order to incorporate the parallel interface routines. However, this does not get over the fact that a connecting cable is still required. Fortunately, these are available as stand-alone items from advertisers in magazines such as this esteemed paper!

## Competition result

### Flight Competition winner

The winner of the Flight Simulation Competition we ran in the September 6 issue is Simon Watson, aged 19, from Harlow in Essex.

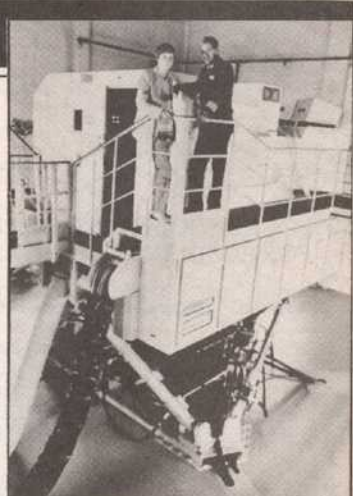
Last week he was awarded his prize — a chance to fly a real flight simulator used to

train commercial airline pilots at British Airways' Cranebrook training centre at Heathrow airport.

British Airways operates three flight simulators at Cranebrook, each of which stands about 40 feet tall and costs a staggering £10m apiece. The machine which Simon spent around two hours flying was a Boeing 757 simulator — a faithful reconstruction of the 757's cockpit supported twenty feet above the ground on powerful hydraulic rams. These are

controlled by two Vax mini-computers to move the cockpit according to the pilot's commands to accurately reproduce the effects of take-off and landing. The illusion is completed with four monitors suspended above the cockpit windows, projecting a high-resolution computer-generated picture of the runway, surrounding buildings, roads and skyline.

It was something of a surprise to discover that Simon already has some flying experience. He hopes to make flying his career and as a first step he



is trying to get private pilot's licence allowing him to fly light aircraft. Even though he has done some flying he has never tried to learn to drive — he says he couldn't afford to do both.

After his two-hour 'flight' he persuaded British Airways' Boeing Training Captain, Roger Benham, to log the simulator 'familiarisation' in his flight record.

Now Simon is looking for a sponsor so that he can continue with his ambition to become a commercial helicopter pilot.





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# Games Designer Competition

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**T**hink you can design an arcade game? This is your chance to put all those great ideas into practice. We want you to design the sequel to Elite's *Kokotoni Wilf*.

**K**okotoni Wilf from Elite Software — one of this Autumn's top selling games on both the Commodore 64 and the Spectrum is to have a sequel. The plot? — that's for you to decide!

*Popular Computing Weekly* offers you the chance to use your own ideas, characters, plot and so on to create the sequel to *Kokotoni Wilf* which will be published by Elite in the new year.

The winner(s) will be credited with the storyline design in all advertising and promotion, and the winner(s) name(s) will be featured in the packaging. In addition, a royalty of 6% of sales achieved will be paid to the winning designer or design team.

## What we want you to do

The competition is open to both individual designers or design teams. You are not asked to actually program the game. All you have to do is to prepare a storyboard — a series of screen drawings or sketches — for the sequel which should explain the action from the first screen to the last.

The finished storyboard should be detailed enough for Elite's programmers and designers to use without any major changes — set yourself a limit of no less than 20 screens of action and no more than 60. It might be helpful to divide your storyboard into two sections, a general guide to the story including overall objectives and method of scoring, etc (limit yourself to a maximum of 800 words). The second section should be much more specific detailing exactly what is going on where in each screen, indicating such things as sprites, background layout and movement paths. To help you, we show on the right one such storyboard from a screen in the first *Kokotoni Wilf* program.

## How to enter

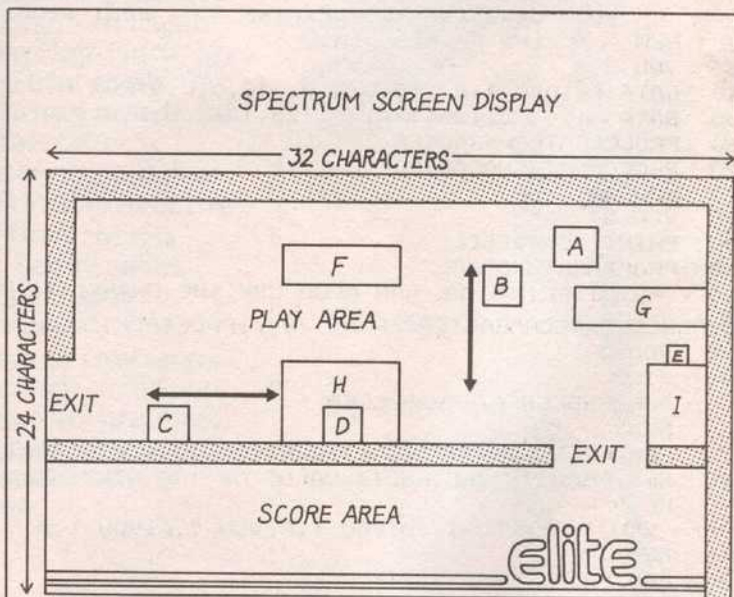
Completed storylines and storyboards should be submitted to Kokotoni Wilf Competition, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP, to arrive no later than 1 January 1985.

All entrants requiring an acknowledgement of receipt should submit a stamped self-addressed envelope. Entrants requiring their work to be returned after judging should send a suitable post paid self-addressed envelope with the entry.

The judges decision will be final. Don't forget to include your name and address! Ten runners up will receive copies of the game which will be produced for the Spectrum and Commodore 64.

It is important to remember that the program you create is to be a sequel and so, in a general way, you should maintain the theme and atmosphere of the original. For anyone not familiar with *Kokotoni Wilf* here is the story so far:

"Legend has it that many hundreds of years ago somewhere in Northern Europe lived a great Magician known as Ulrich. Ulrich knew of a magic amulet, fragments of which had been scattered throughout time. Ulrich wished to wield its power, but he was too old and infirm for such an arduous adventure and so charged his protegee Kokotoni Wilf with the epic task. Ulrich sent Wilf back in time to the age of the great dinosaurs, there to begin his quest through the ages for each fragment of the Amulet. Ulrich has provided Wilf with magic wings and time gates to pass from age to age — your task is to guide Wilf in his epic quest."



## TIME-ZONE 3 : SCREEN 1

- A : STARTING POSITION OF KOKOTONI WILF
- B : STARTING POSITION OF 'BOOK' SPRITE
- C : STARTING POSITION OF 'BOILING POT' SPRITE
- D : ANIMATED 'FIRE' SPRITE
- E : LOCATION OF AMULET FRAGMENT
- F, G, H, I : SKULL SHELF; POTS SHELF; OPEN RANGE; SKELETON.

BOLD ARROWS SHOW SPRITE MOVEMENT PATTERNS.  
SHADED AREA SHOWS IMPENETRABLE BORDERS.



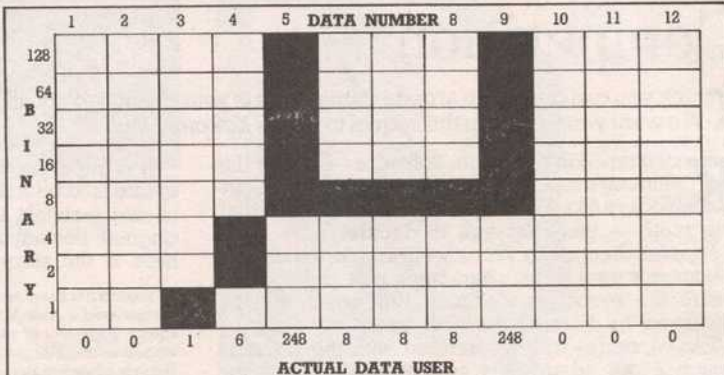
## Reform your character

User-defined graphics on your Epson made easy on the BBC B by A. Fennell

**T**his program allows you to produce User Defined Graphics on the Epson FX80 printer. The character is defined on an 8 by 12 grid (see right) — as explained in the printer manual — and these values are stored in the Data statements at Lines 40 & 50.

The first numbers are the *ASCII* codes for the characters to be changed, ie [=91. Any character could be used.

As I have shown in the program, the UDG can be used with normal characters (once it has been defined) but the printer must be set back to the original character set, using *Procbactonormal*, (see Line 120 for example). I have created a  $\mu$  and a # sign as examples, but the only real limit is your own inventiveness.



```

10 REM program to produce UDG on the FX-80 printer.see page 3-38
    of manual.produces a mu sign VDU2 enables the printer
    VDU3 disables the printer VDU1 sends next character to
20 REM the printer only
30 VDU 2
40 DATA 64,0,0,1,6,248,8,8,8,248,0,0,0:REM @ => MU ON PRINTER
50 DATA 91,0,36,126,126,36,126,126,36,0,0,0,0:REM [ => £ ON PRINTER
60 PROCCREATECHARACTER
70 PROCCREATECHARACTER
80 VDU 3
90 VDU 2
100 PRINT "#####[]"
110 PROCBACKTONORMAL
120 PRINT:PRINT "WE CAN ALSO USE THE CHARACTER ";:RESTORE
40:PROCCREATECHARACTER:PRINT "@"::PROCBACKTONORMAL:PRINT " IN A SENTENCE"
130 VDU 3
140 STOP
150 DEF PROCCREATECHARACTER
160 REM
170 REM PRINT CHR$(27); "&"; CHR$(0); CHR$(£); CHR$(£);
180 REM READ IN THE ASCII VALUE OF THE NEW CHARACTER
190 READ A
200 VDU 1,27:VDU 1,38:VDU 1,0:VDU 1,A:VDU 1,A
210 REM
220 REM PRINT CHR$(139);
230 VDU 1,139
240 REM
250 REM DEFINE THE 8*12 SHAPE FOR THE CHARACTER
260 FOR I=1 TO 12:READ A:VDU 1,A:NEXT
270 REM
280 REM PRINT CHR$(27); "%"; CHR$(1); CHR$(0)
290 VDU 1,27:VDU 1,37:VDU 1,1:VDU 1,0
300 ENDPROC
310 DEF PROCBACKTONORMAL
320 REM return printer characters to normal
330 VDU 1,27:VDU 1,37:VDU 1,0:VDU 1,0
340 ENDPROC

```





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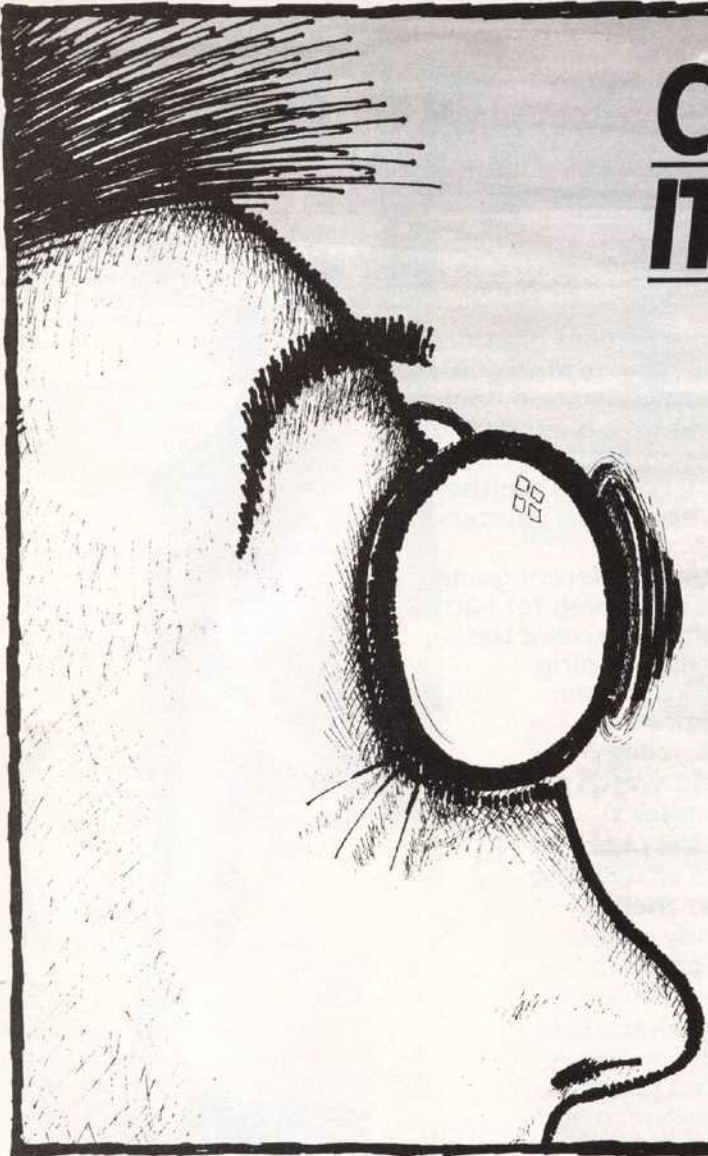
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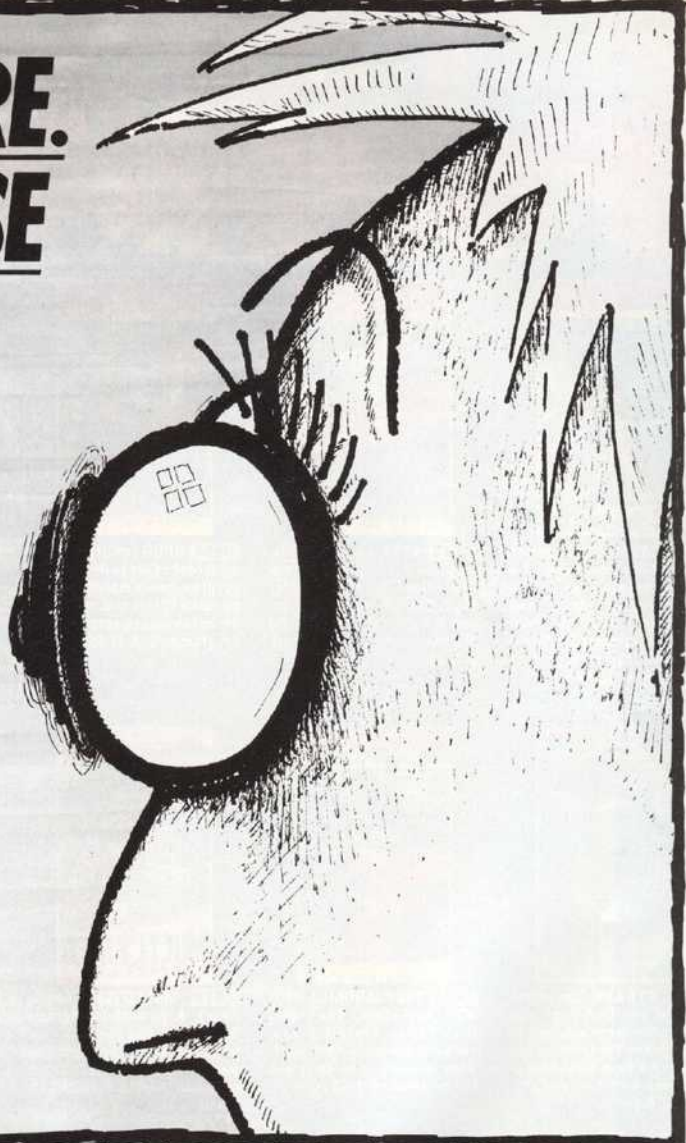


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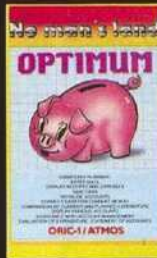
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## Routine input

For easier inputting and editing of your data a program from M J Amess

This program consists of one major procedure, called *Cinput*, which provides a convenient method for accepting data from the user's terminal. It provides a number of data formats to allow almost any type of data to be entered and checked for validity.

This routine can reside at the end of your own programs and be called whenever data input is required. It is called by typing *Cinput* and is followed by a list of formal parameters, which will supply data for the procedure. To see what formal parameters are used look at Line 30020 which defines the procedure. The parameters used are, *Row*, *Col*, *Max*, *Min*, *Types*, *Old Ink*, *Old Paper*. *Row* and *Col* define the screen coordinates at which the data is to be accepted. *Max* and *Min* are used to define the maximum and minimum number of characters that are to be accepted by the procedure.

The *Cinput* procedure types periods (.) at the specified screen position to show the user the maximum number of characters allowed (taken from the value entered in the *Max* variable). In case of an error whilst

entering data, messages are displayed in Screen #0.

The most important parameter that must be entered is *Types*. This is a one or two character string defining the type of data to be entered. There are eight main types which are:

- 1) 'D' = Enter a date, in the format DDMMYY. This is edited for a valid Day and Month and redisplayed in DD/MM/YY format.
- 2) 'A' = Alphanumeric. All characters are valid.
- 3) 'N' = Enter any positive integer numeric.
- 4) 'N' = Accept any positive numeric and display it in a monetary form. The numeric is entered without a decimal point. For example, if 10021 is entered this is automatically redisplayed as 100.21.
- 5) 'NN' = Negative numeric. This is exactly the same as the 'N' type except that the numeric entered is changed to a negative. The user enters the numeric as a positive and the computer redisplay the value as a negative.
- 6) 'Y' = Accept Yes/No or Esc. The computer will await the user to press either the 'Y', 'N'

or 'Esc' keys. Pushing the 'Enter' key will have the same effect as pushing the 'Y' key.  
7) 'P' = Accepts an alphanumeric password. This type uses the *Old Ink* and *Old Paper* variables so that any typed data is not displayed in a visible form on the screen. These two variables must be set to the current *Ink* and *Paper* values that are being used.

8) 'V' = Verification — accepts only a carriage return (enter key).

All data which is entered is stored in the variable *Entry*, even numeric data, which can be stored later in a numeric variable.

One final facility is that instead of entering the expected data you may enter *End* (or push the Esc key in the 'Y' option). This sets a variable, *Inxctl*, to 3 which could signify that the user wishes to escape from a particular option within his/her program. During normal use *Inxctl* will be set to zero if the procedure is completed Ok. If 'Y' is pushed in the *Yes/No* field then *Inxctl* is set to 1, or if 'N' is pushed then *Inxctl* will equal 2.

The following is an example of the *Cinput* procedure. Type, *Cinput 10,5,20,5,'A'*.

This will accept any alphanumeric data at position 10,5 on the terminal. The maximum number of characters that will be accepted is 20 and the minimum is 5. Please note that the *Ink* and *Paper* variables need only be entered when using the password option.

```

30000 REMARK ENHANCED INPUT ROUTINE
30005 REMARK COPYRIGHT 1984 M.J.AMESS
30010 REMARK VERSION R51.0A 19/08/84
30015 REMARK ** **
30020 DEFINE PROCEDURE CINPUT(ROW,COL,MAX,MIN,
TYPE$,OLD_INK,OLD_PAPER)
30025 INXCTL=0:CLS #0
30030 IF TYPE$="D" THEN DATE_ENTER
30035 IF TYPE$="A" THEN ALPHA
30040 IF TYPE$="N" OR TYPE$="NN" OR TYPE$="IN"
THEN NUMERIC
30045 IF TYPE$="Y" THEN YES_NO
30050 IF TYPE$="P" THEN PASSWORD
30055 IF TYPE$="V" THEN VERIFY
30060 END DEFINE CINPUT
30065 REMARK ***** ENTER DATE *****
30070 DEFINE PROCEDURE DATE_ENTER
30075 MIN=6:MAX=6
30080 REPEAT LOOP
30085 ENTER_VALUE
30090 IF INXCTL=3 THEN EXIT LOOP
30095 SET=0
30100 MAX=6:MIN=6 : CHK_LENGTH:IF SET THEN GO
TO 30085
30105 MONTH$=ENTRY$(3 TO 4) : YEAR$=ENTRY$(5
TO 6)
30110 DTE$=ENTRY$(1 TO 2)
30115 IF MONTH$ < 1 OR MONTH$ > 12 THEN SET=1
30120 IF DTE$ > 31 OR DTE$ < 1 THEN SET=1
30125 IF DTE$ > 29 AND MONTH$=2 THEN SET=1
30130 IF MONTH$=4 OR MONTH$=6 OR MONTH$=9 OR
MONTH$=11 THEN
30135 IF DTE$=31 THEN SET=1
30140 END IF
30145 IF NOT SET THEN EXIT LOOP
30150 END REPEAT LOOP
30155 IF INXCTL <> 3 THEN
30160 AT ROW,COL:PRINT DTE$,"/"/MONTH$,"/"
YEAR$
30165 END IF
30170 END DEFINE DATE_ENTER
30175 REMARK ***** ENTER ANY ALPHANUMERIC
*****
30180 DEFINE PROCEDURE ALPHA
30185 REPEAT LOOP
30190 ENTER_VALUE
30195 IF INXCTL=3 THEN EXIT LOOP
30200 SET=0:CHK_LENGTH
30205 IF NOT SET THEN EXIT LOOP
30210 END REPEAT LOOP
30215 END DEFINE ALPHA
30220 REMARK ***** ENTER NUMERIC *****
30225 DEFINE PROCEDURE NUMERIC
30230 REPEAT LOOP
30235 ENTER_VALUE
30240 IF INXCTL=3 THEN EXIT LOOP
30245 SET=0:CHK_LENGTH
30250 IF SET THEN GO TO 30235
30255 SET=0
30260 FOR VALUE=1 TO LEN(ENTRY$)
30265 IF CODE(ENTRY$(VALUE)) < 48 OR CODE(ENT
RY$(VALUE)) > 57 THEN SET=1
30270 END FOR VALUE
30275 IF SET THEN GO TO 30315
30280 IF TYPE$="IN" THEN GO TO 30315
30285 IF LEN(ENTRY$)=2 THEN ENTRY$="0" &
ENTRY$:GO TO 30295
30290 IF LEN(ENTRY$)=1 THEN ENTRY$="00" &
ENTRY$
30295 LINE$=ENTRY$(1 TO ((LEN(ENTRY$))-2))
30300 LINE$=LINE$ & ".":LINE$=LINE$ & ENTRY$(
LEN(ENTRY$)-1 TO LEN(ENTRY$))
30305 ENTRY$=LINE$
30310 AT ROW,COL:CLS #1,4:PRINT ENTRY$
30315 IF NOT SET THEN EXIT LOOP

```



```

30320 END REPEAT LOOP
30325 IF TYPE$="NN" THEN
30330 ENTRY$=" " & ENTRY$
30335 AT ROW,COL:CLS #1,4:PRINT ENTRY$
30340 END IF
30345 END DEFINE NUMERIC
30350 REMARK ***** SELECT "Y","N" OR ESC
*****
30355 DEFINE PROCEDURE YES_NO
30360 MIN=1:MAX=1
30365 REPEAT FIND_LOOP
30370 DOT:PRINT "Y":AT ROW,COL
30375 A=CODE(INKEY$(1))
30380 IF A=78 OR A=89 OR A=27 OR A=10 THEN EXIT
FIND_LOOP
30385 END REPEAT FIND_LOOP
30390 IF A=27 THEN AT ROW,COL:PRINT "ESC":
INXCTL=3
30395 IF A = 78 THEN INXCTL=2:AT ROW,COL:PRINT
"N":
30400 IF A=89 OR A=10 THEN INXCTL=1
30405 END DEFINE YES_NO
30410 REMARK ***** ENTER PASSWORD *****
30415 DEFINE PROCEDURE PASSWORD
30420 INK OLD_PAPER
30425 REPEAT LOOP
30430 ENTER_VALUE
30435 IF INXCTL=3 THEN EXIT LOOP
30440 SET=0:CHK_LENGTH
30445 IF NOT SET THEN EXIT LOOP
30450 END REPEAT LOOP
30455 INK OLD_INK:PAPER 0
30460 END DEFINE PASSWORD
30465 REMARK ***** VERIFICATION *****
30470 DEFINE PROCEDURE VERIFY
30475 MAX=0:MIN=0
30480 REPEAT LOOP
30485 SET=0
30490 ENTER_VALUE
30495 CHK_LENGTH: IF NOT SET THEN EXIT LOOP
30500 END REPEAT LOOP
30505 END DEFINE VERIFY
30510 STOP
30515 DEFINE PROCEDURE DOT
30520 AT ROW,COL:CLS #1,4
30525 IF TYPE$="P" THEN INK OLD_INK
30530 PRINT (FILL$(1,MAX))
30535 AT ROW,COL
30540 IF TYPE$="P" THEN INK OLD_PAPER
30545 END DEFINE DOT
30550 DEFINE PROCEDURE ENTER_VALUE
30555 AT ROW,COL:CLS #1,4
30560 DOT:INPUT ENTRY$
30565 IF ENTRY$="" THEN RETURN
30570 IF ENTRY$(1 TO 3)=""END" AND LEN(ENTRY$)=3
THEN INXCTL=3
30575 END DEFINE ENTER
30580 DEFINE PROCEDURE CHK_LENGTH
30585 IF LEN(ENTRY$) > MAX THEN
30590 INPUT #0:"ENTRY TOO LONG - CR TO CONT
INUE":A$=CLS #0:SET=1
30595 END IF
30600 IF LEN(ENTRY$) < MIN THEN
30605 INPUT #0:"ENTRY TOO SHORT - CR TO CON
TINUE":A$=CLS #0:SET=1
30610 END IF
30615 END DEFINE CHK_LENGTH

```



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Lines 110 to 410 contain the data representing the machine code.

### Listing B — the Assembler Listing

The assembly listing was not written to be a model of assembly programming, nor to be the most efficient method or even a structured method. It was written to investigate the use of Rom routines and as such it is worth examination. It undoubtedly will extend to a full blown monitor. If you attempt this you will discover that the *Concise Firmware Specification* has everything you need.

### Program Notes

Lines 5-250 define the text for a simple menu and label some Rom routines for the program proper. Lines 260-880 place menu to screen using colours and pass to Line 1680 (Holdup). Holdup awaits input and then passes control to the appropriate routine. You should be able to follow from there the routines for outputting the hex-dump and character dump. Note the highlighting of Ascii-characters in the dump, by use of colour changes. The Rom routines used (with their official names) are:

#BB5A Txt Output — Outputs a character or control code to the text VDU.  
#BB18 Km Wait Key — Waits for next key from the keyboard.  
#BB1B Km Read Key — As #BB18 but doesn't wait.  
#BB90 Txt Set Pen — Set ink for writing colours.

#BB00 KI U Rom Enable — Turn on the Upper Rom.  
#BB03 KI U Rom Disable — Turn off the Upper Rom.  
#BB06 KI L Rom Enable — Turn on the Lower Rom.  
#BB09 KI L Rom Disable — Turn off the Lower Rom.  
#BB75 Txt Set Cursor — Set cursor position.  
#BB7E Txt Cur Disable — Disallow cursor display.  
#BB8D Txt Wr Char — Write a character to the screen — control codes are printed and not obeyed. Reset key manage, clear all buffers, restore standard key expansions and indirections.  
#BB03 Km Reset —

### Using the Program

When initiated the program offers a Menu. First press *Caps Lock* and then press the letter corresponding to the memory you wish to examine.

*L* will be the hex and character dump of Low Rom from address 0 (it actually starts somewhat later) to #3FFF. It will stop at the end and return to Menu. *H* will similarly deal with the High Rom ending at #FFFF. *R* deals with all Ram up to #BFFF (the memory that follows is the default screen memory).

*Enter* will stop the display to allow closer inspection. Also whilst 'stopped' you have the option to rapidly advance the memory display in increments of 256-bytes by pressing *I*. When the indicator reaches the desired address press *C* to continue. Alternately *E* will return to Basic or *Q* will return

Menu. *Enter* will resume display and scroll.

### Screen Display

From left to right the screen display consists of: Hex Address; eight hex values (the first corresponds to the Hex Addr. The remainder correspond to the previous address plus 1).

These are then followed by the character representation of the hex values. The next line increments the address by 8 and so on.

The hex dump is interesting, as it displays text embedded in the operating system. In Low Rom you will discover after the titles some strange names — Schneider for example. Even Arnold, the pet name for the machine, is mentioned. High Rom lists all the error codes. Well, have a look and see!

Potentially the Hex-dump can be very useful. Look for C9 (this is a return instruction) — the codes following this may well be the start of a useful sub-routine.

Within the bounds of a small article and one simple program, many points will go unmentioned — much will be oversimplified.

I hope to have given you a new slant to your machine without incurring too many 'tuts tuts' from those that know more, and those that know better!

```
e, 54, 49, 4e, 55, 45, 0, f5, c5, d5, e5, cd, 7e, bb
220 DATA 3e, c, cd, 5a, bb, 19, 1e, 5, 14, 7a, cd, 5a, bb, 23, 10, f9, 78, fe, 28,
28, f, 3e, d, cd, 5a, bb, 3e, a, cd, 5a, bb, 3e
230 DATA a, cd, 5a, bb, c9, 15, 2, cd, 7a, a6, 2f, ba, a2, 6, 25, cd, 21, a4, 15, 2
, cd, 7a, a6, 21, de, a2, 6, 19, cd, 21, a4, 21
240 DATA b, a3, cd, 1f, a4, 1e, 1, cd, 7a, a6, 2f, f7, a2, cd, 1f, a4, 21, 1f, a3,
, cd, 1f, a4, 21, 33, a3, cd, 1f, a4, 21, 47, a3, cd
250 DATA 1f, a4, 21, 81, a3, 6, 1e, cd, 21, a4, 21, 5b, a3, 6, 26, cd, 21, a4, 15,
2, cd, 7a, a6, 21, 9f, a3, 6, 28, cd, 21, a4, 15
260 DATA 1, cd, 7a, a6, e1, d1, c1, f1, c3, 3d, a5, cd, 0, b9, e, 0, 1e, 5, 21, 0, c
0, 3e, c, cd, 5a, bb, 79, fe, 0, 20, 17, 3e
270 DATA d, cd, 5a, bb, 3e, a, cd, 5a, bb, 16, 3, cd, 7a, a6, 3e, d, cd, 5a, bb, cd
, 17, a5, 3e, 20, cd, 5a, bb, cd, 1b, bb, fe, d
280 DATA 28, 63, 16, 2, cd, 7a, a6, 7e, cd, 20, a5, 15, 2, cd, 7a, a6, c, 23, 7b, f
e, 9, 28, 14, 7d, fe, ff, 20, 19, 7c, fe, ff, 28
290 DATA 3c, 7d, fe, ff, 20, f, 7c, fe, 2f, 28, 37, 7d, fe, ff, 20, 5, 7c, fe, bf,
28, 2d, 79, fe, 8, c2, b2, a4, e, 0, 18, 67, 7c
300 DATA cd, 20, a5, 7d, cd, 20, a5, c9, f5, f, f, f, cd, 29, a5, f1, e6, f, c6,
90, 27, ce, 40, 27, cd, 5a, bb, c9, 21, 0, c0
310 DATA 18, 3, 21, 0, 0, 3e, 7, cd, 5a, bb, cd, 18, bb, fe, 48, ca, a3, a4, fe, 45
, 28, 17, fe, d, 28, 28, fe, 4c, 28, 15, fe, 51
320 DATA ca, 11, a4, fe, 52, 28, 54, fe, 49, 28, 75, 18, d8, 16, 1, cd, 7a, a6, c9
, e, 0, 1e, 3, 21, 0, 0, cd, 5, b9, 3e, c, cd
330 DATA 5a, bb, c3, b2, a4, c9, 3e, 20, cd, 5a, bb, 3e, 20, cd, 5a, bb, 15, 1, cd
, 7a, a6, d5, 11, 8, 0, ed, 52, d1, e5, d5, c5, f5
340 DATA 7e, fe, 20, fa, a9, a5, fe, 7e, fa, a8, a5, 16, 3, cd, 7a, a6, cd, 5d, bb
, 15, 1, cd, 7a, a6, f1, c1, d1, e1, 23, c, 79, fe
350 DATA 8, 20, d9, e, 0, c3, b2, a4, c3, 11, a4, cd, 9, b9, cd, 0, b9, 3e, c, cd, 5
a, bb, 21, 0, 0, e, 0, 1e, 9, c3, b2, a4
360 DATA 3e, c, cd, 5a, bb, d5, c5, f5, e5, 3e, 2, cd, 90, bb, 21, c6, a3, 5, 16, c
d, 21, a4, 2e, d, cd, 5a, bb, 3e, a, cd, 5a, bb
370 DATA 21, db, a3, 6, 1e, cd, 21, a4, 3e, d, cd, 5a, bb, 3e, a, cd, 5a, bb, 21, f
9, a3, 6, 17, cd, 21, a4, e1, f1, c1, d1, 2e, 0
380 DATA 24, cd, 63, a5, 7c, ba, 20, 3, e1, e, 0, f5, e5, 21, 1, 16, cd, 75, bb, 3e
, 1, cd, 90, bb, 3e, 26, cd, 5a, bb, 21, 1, 17
390 DATA cd, 75, bb, e1, f1, cd, 17, a5, cd, 18, bb, fe, 43, 28, 6, fe, 49, 28, cd
, 18, 13, e, 0, f5, e5, d5, c5, cd, 3, bb, c1, d1
400 DATA e1, f1, 3e, c, cd, 5a, bb, c3, b2, a4, 7b, fe, 3, 20, 5, 16, 3f, e, 0, c9,
fe, 5, 20, 5, 16, ff, e, 0, c9, 16, bf, e
410 DATA 0, c9, f5, e5, 7a, cd, 90, bb, e1, f1, c9
```









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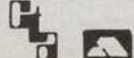
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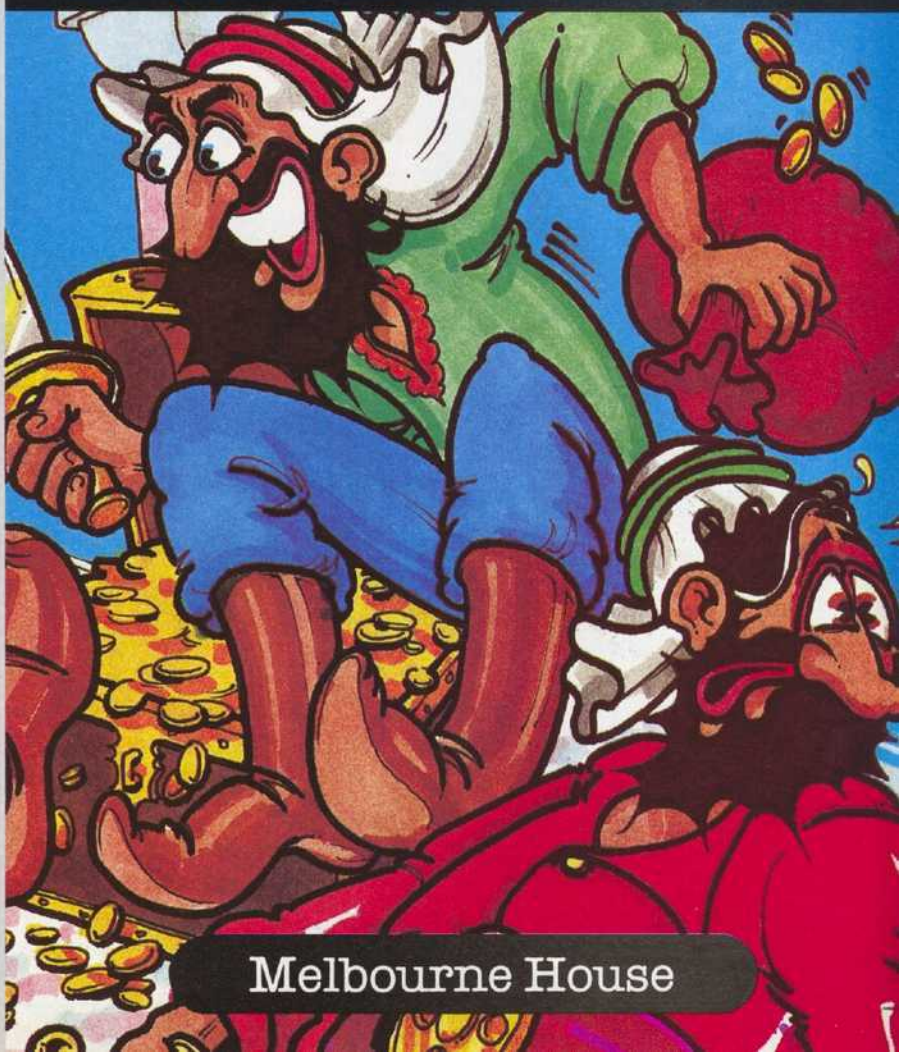
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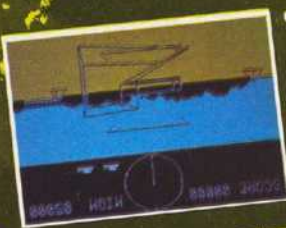
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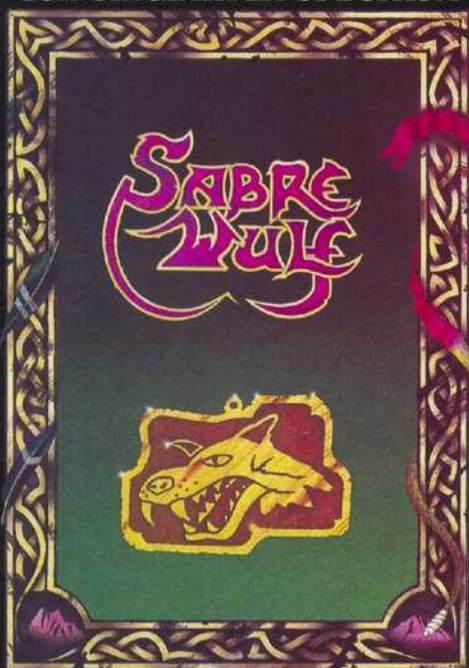


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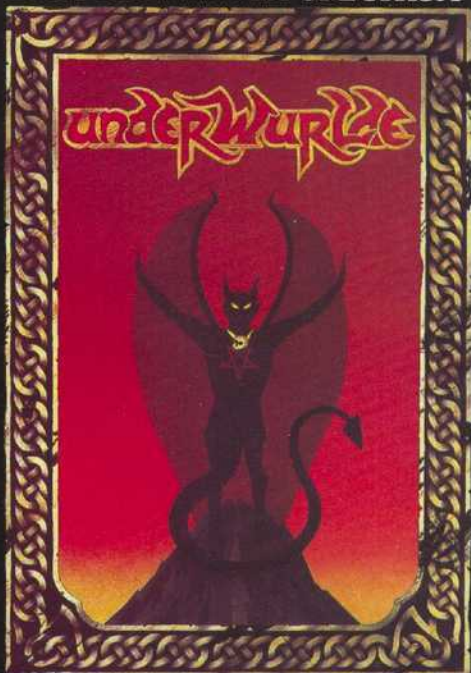


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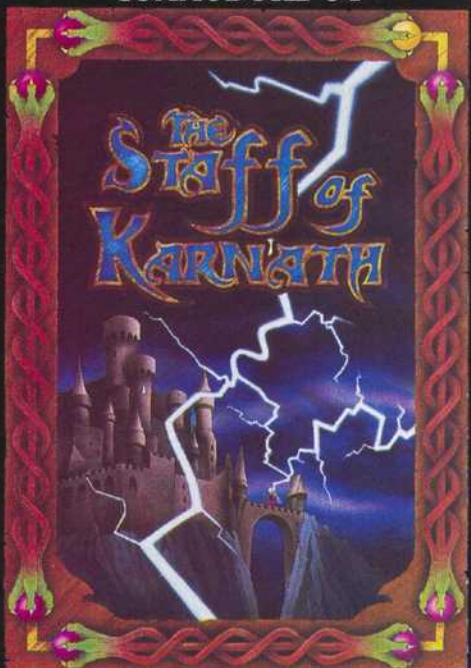
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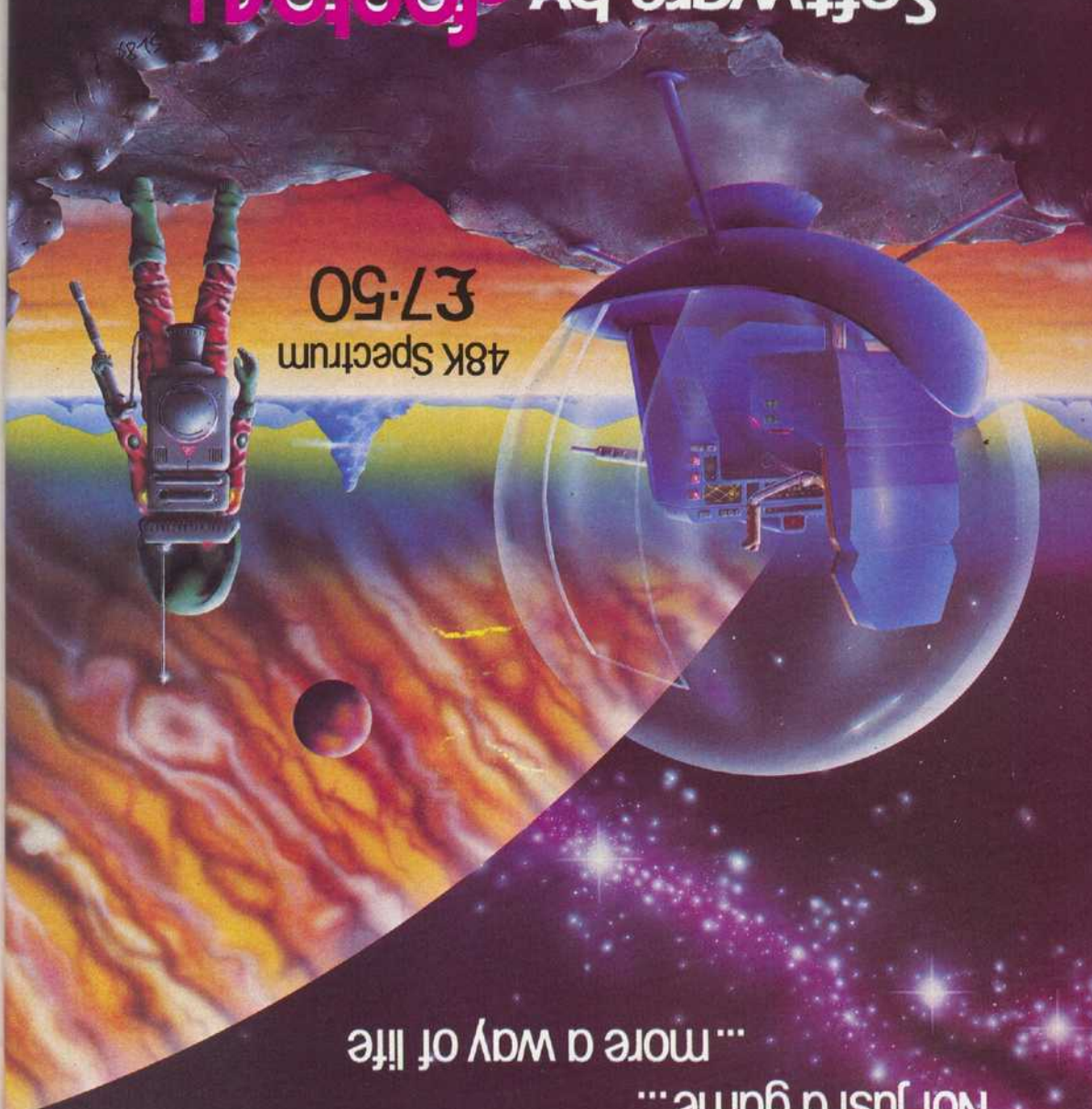
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A540	3E97	1690	HOLDUP	LD	A, #07	A5FB	9E1F	2570	LD	B, 20
A541	CD5AB8	1690		CALL	OPUT	A5FD	CD21A4	2580	CALL	HEXCH
A542	CD18BB	1700		CALL	KYWAIT	A600	3E9D	2590	LD	A, #00
A543	FE48	1710		CP	#48	A602	CD5AB8	2600	CALL	OPUT
A547	CAAB3A4	1720		JP	Z, BEGIN	A605	3E9A	2610	LD	A, #0A
A54A	FE45	1730		CP	#45	A607	CD5AB8	2620	CALL	OPUT
A54C	FE47	1740		JP	Z, NOMORE	A60A	21F9A3	2630	LD	HL, TEXT15
A54E	FE0D	1750		CP	#0D	A60D	9E17	2640	LD	B, 23
A550	2B8B	1760		JP	Z, CONT	A60F	CD21A4	2650	CALL	HEXCH
A552	FE4C	1770		CP	#4C	A612	E1	2660	POP	HL
A554	2E15	1780		JP	Z, LOROM	A613	F1	2670	POP	AF
A556	FE51	1790		CP	#51	A614	C1	2680	POP	BC
A558	CA11A4	1800		JP	Z, TOPS	A615	D1	2690	POP	DE
A55B	FE52	1810		CP	#52	A616	2E00	2700	LD	L, 0
A55D	2B64	1820		JP	Z, ALLRAM	A618	24	2710	ANDT	INC H
A55F	FE49	1830		CP	#1*	A619	CD62A6	2720	CALL	ENSTOP
A561	2B75	1840		JP	Z, UPABIT	A61C	7C	2730	LD	A, H
A563	18DB	1850		JP	HOLDUP	A61D	BA	2740	CP	D
A565	1691	1860	NOMORE	LD	D, #01	A61E	2003	2750	JP	HZ, OKAY
A567	CD7AA6	1870		CALL	COLOUR	A620	61	2760	LD	H, C
A56A	C9	1880		RET		A621	0E00	2770	LD	C, #00
A56B	0E00	1890	LOROM	LD	C, #00	A623	F5	2780	OKAY	PUSH AF
A56D	1E03	1900		LD	E, #03	A624	E5	2790	PUSH	HL
A56F	210000	1910		LD	HL, #0000	A625	210116	2800	LD	HL, #1601
A572	CD06B9	1920		CALL	OHLDRO	A628	CD758B	2810	CALL	SETCPU
A575	3E9C	1930		LD	A, #0C	A62B	3E01	2820	LD	A, #01
A577	CD5AB8	1940		CALL	OPUT	A62D	CD90BB	2830	CALL	SETPEN
A57A	C3B2A4	1950		JP	ISIT	A630	3E26	2840	LD	A, #*
A57D	C9	1960		RET		A632	CD5AB8	2850	CALL	OPUT
A57E	3E20	1970	CHARS	LD	A, #20	A635	210117	2860	LD	HL, #1701
A580	CD5AB8	1980		CALL	OPUT	A638	CD758B	2870	CALL	SETCPU
A583	3E20	1990		LD	A, #20	A63B	E1	2880	POP	HL
A585	CD5AB8	2000		CALL	OPUT	A63C	F1	2890	POP	AF
A588	1691	2010		LD	D, #01	A63D	CD17A5	2900	LD	CALL FOURB
A58A	CD7AA6	2020		CALL	COLOUR	A640	CD18BB	2910	TESTIT	CALL KYWAIT
A58D	D5	2030		PUSH	DE	A643	FE43	2920	CP	#*
A58E	110000	2040		LD	DE, #000B	A645	290C	2930	JP	Z, SOFTY
A591	ED52	2050		SBC	HL, DE	A647	FE49	2940	CP	#1*
A593	D1	2060		POP	DE	A649	2B0D	2950	JP	Z, ANDT
A594	E5	2070	INCH	PUSH	HL	A64B	18F3	2960	LD	TESTIT
A595	D5	2080		PUSH	DE	A64D	0E00	2970	SOFTV	LD C, #00
A596	C5	2090		PUSH	BC	A64F	F5	2980	START	PUSH AF
A597	F5	2100		PUSH	AF	A650	C5	2990	PUSH	HL
A598	7E	2110		LD	A, (HL)	A651	D5	3000	PUSH	DE
A599	FE20	2120		CP	#20	A652	C5	3010	PUSH	BC
A59B	FAA3A5	2130		JP	M, COLCH	A653	CD03BB	3020	CALL	#BB03
A59E	FE7E	2140		CP	#7E	A656	C1	3030	POP	BC
A5A0	FAA8A5	2150		JP	M, TEXCH	A657	D1	3040	POP	DE
A5A3	1603	2160	COLCH	LD	D, #03	A658	E1	3050	POP	HL
A5A5	CD7AA6	2170		CALL	COLOUR	A659	F1	3060	POP	AF
A5A8	CD5DBB	2180	TEXCH	CALL	#BB5D	A65A	3E0C	3070	LD	A, #0C
A5AB	16D1	2190		LD	D, #01	A65C	CD5AB8	3080	CALL	OPUT
A5AD	CD7AA6	2200		CALL	COLOUR	A65E	C3B2A4	3090	JP	ISIT
A5B0	F1	2210		POP	AF	A662	7B	3100	ENSTOP	LD A, E
A5B1	C1	2220		POP	BC	A663	FE03	3110	CP	#03
A5B2	D1	2230		POP	DE	A665	2005	3120	JP	HZ, EN56
A5B3	E1	2240		POP	HL	A667	1E3F	3130	LD	D, #3F
A5B4	23	2250		INC	HL	A669	0E00	3140	LD	C, #00
A5B5	0C	2260		INC	C	A66B	C0	3150	RET	
A5B6	79	2270		LD	A, C	A66C	FE06	3160	EN55	CP #06
A5B7	FE0B	2280		CP	#0B	A66E	2005	3170	JP	HZ, EN59
A5B9	2009	2290		JP	HZ, INCH	A670	1EFF	3180	LD	D, #FF
A5BB	0E00	2300		LD	C, #00	A672	0E00	3190	LD	C, #00
A5BD	C3B2A4	2310		JP	ISIT	A674	C9	3200	RET	
A5C0	CD11A4	2320	FINIT	JP	TOPS	A675	1E8F	3210	EN59	LD D, #DF
A5C3	CD06B9	2330	ALLRAM	CALL	OHLDRO	A677	0E00	3220	LD	C, #00
A5C6	CD06B9	2340		CALL	OHLDRO	A679	C9	3230	RET	
A5C9	3E9C	2350		LD	A, #0C	A67A	C5	3240	COLOUR	PUSH AF
A5CB	CD5AB8	2360		CALL	OPUT	A67B	E5	3250	PUSH	HL
A5CE	210000	2370		LD	HL, #0000	A67C	7A	3260	LD	A, D
A5D1	0E00	2380		LD	C, #00	A67D	CD90BB	3270	CALL	SETPEN
A5D3	1E00	2390		LD	E, 0	A680	E1	3280	POP	HL
A5D5	C3B2A4	2400		JP	ISIT	A681	F1	3290	POP	AF
A5D8	3E9C	2410	UPABIT	LD	A, #0C	A682	C9	3300	RET	
A5DA	CD5AB8	2420		CALL	OPUT	ALLRAM	A5C3	ANDT	A618	ADNT
A5DD	D5	2430		PUSH	DE	BEGIN	A1A3	BIT5	A529	CHARS
A5DE	C5	2440		PUSH	BC	COLOUR	A67A	CONT	A1D4	EN56
A5DF	F5	2450		PUSH	AF	ENSTOP	A662	FINIT	A529	FOURB
A5E0	E5	2460		PUSH	HL	HERE	A497	HOLDHI	A530	HOLDLO
A5E1	3E9C	2470		LD	A, #0C	INCH	A594	ISIT	A4B2	ISRAM
A5E3	CD90BB	2480		CALL	SETPEN	KYWAIT	BB1B	LOROM	A56B	MISS
A5E6	21C6A3	2490		LD	HL, TEXT13	NOMORE	A5E5	NOW	A430	OFDRO
A5E9	0616	2500		LD	B, 22	OKAY	A633	OHLDRO	B906	OHLDRO
A5EB	CD21A4	2510		CALL	HEXCH	SETCPU	BB75	SETPEN	B906	SETPEN
A5EE	3E0C	2520		LD	A, #0D	START	AGAF	TESTIT	A640	TEXCH
A5F0	CD5AB8	2530		CALL	OPUT	TEXT14	A39F	TEXT12	A3B1	TEXT13
A5F3	3E0A	2540		LD	A, #0A	TEXT15	A3F9	TEXT3	A2F7	TEXT5
A5F5	CD5AB8	2550		CALL	OPUT	TEXT6	A31F	TEXT7	A333	TEXT8
A5F8	21DPA2	2560		LD	HL, TEXT14	TOPS	A411	UPABIT	A5D8	



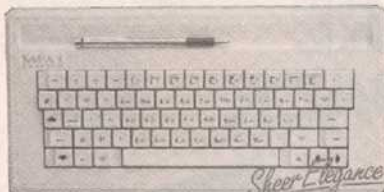




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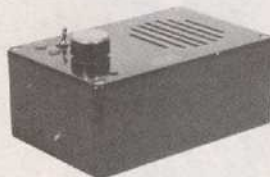
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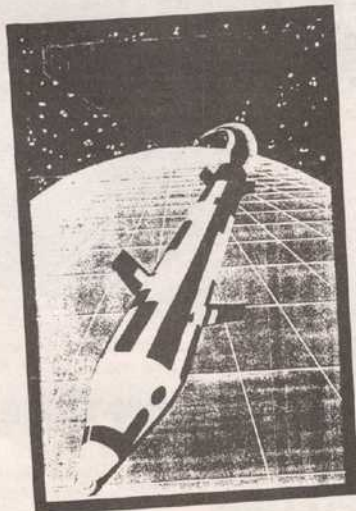
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pcw11/22

**TOUCH-TYPE TOUCH-TYPE TOUCH-  
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## SYNTAX ERROR!

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## Line Feed

on Amstrad

As the User Manual informs you, the Amstrad Basic issues a line feed *Chr\$(10)* and a carriage return *Chr\$(13)* to a printer. If your printer, as mine does, also line feeds then *List* produces a double spacing. My

following:

PRINT 1 — jump if not 10  
CP 10 — Compare A with 10

solution is to use a short sub-routine to detect *Chr\$(10)* and to change it. The jumpblock for printing a character is amended. My program Pokes a jump to \$BD2B which is in Ram and so can be arranged. My program Pokes a jump to \$BD2B which is in Ram and so can be

to test, enter the listing then run it. Set Width 255 then List, #8. You should get a normal listing.

For future use Save this program, then Load the program you wish to list. Width 255 then List, #8. You should get a normal listing.

ADP A,A — Doubles A to 20

RST 08 — Default codes at \$BD2D

= CFF28C

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## The Music Box



## Half-way good

I've just spent a couple of hours playing with Super-soft's *Music Master* program, written for the Commodore 64 by Nick Higham.

Like all the music programs around at the moment, *Music Master* is a half-way good program — which is only to say that it has weaknesses and strengths. Despite the program's regrettable name, its

strengths make *Music Master* the equal — if not the superior turn the 64 into a real-time of any program designed to (even through an unmodified keyboard. In particular, the pre-set backing-track facility is versatile and sounds good

falls down is on its sequencing (TV set). Where *Music Master* cord tracks.

When will somebody pro-

duce an adequate self-contained sequencer allowing over-dubbing and mixing of the 64's three sound channels real-time? Even the much-varied *MusicCalc* from the American company Waveform is lacking in this respect.

The important thing, as far as sequencing is concerned, is to be able to hear one track while you are recording another — in other words, to be able to accompany yourself. While *MusicCalc* allows you to alter and edit tracks at will, it only allows you to do this with great difficulty, and the ability to

accompany yourself in a simple and obvious way seems to be entirely absent.

If I've missed something in either of these programs (which, incidentally, share this lack with Quicksilver's own *Music Maker*) please let me know. I suspect I haven't, partly because my own experience suggests that the timing of a three-channel sequencer is quite

tricky, since you have to read and write to the computer's sound chip at more or less the

same moment.

Step-time sequencing is another matter. This involves writing notes in one form or another and using the screen as a sort of score. Notes are entered in sequence but one step at a time, often by typing in their name (C-major, for example). Here *Music Master* has the edge on *MusicCalc*, even though it is still not perfect, by any means. The problem is with notation — *Music*

*Master* uses parallel lines on which note names appear as designed for good looks rather than clarity, is the third.

Nevertheless, a composing tool to be reckoned with — I can hardly wait for the 64 version.

The model of step-time sequencing has to be Island Logic's *The Music System* for the BBC Model B (a Commodore

This is the nearest thing to a real composing program, although I haven't tried it yet. What's more, the slaves can then be dumped to any Centronics dot-matrix printer. I hope some-

body comes up with a form of

body comes up with a form of

body comes up with a form of

body comes up with a form of

body comes up with a form of

body comes up with a form of

Line Feed  
by J Povey

10 CLS:MEMORY 42999  
20 FOR A=48427 TO 48429  
30 REPD B:POKE A,B  
40 NEXT A  
50 FOR A=43000 TO 43008  
60 REPD B:POKE A,B  
70 NEXT A  
80 DATA 195,248,167,254,10,32,1,135,207,242,135,201

Load the program you wish to list. Width 255 then List, #8.

For future use Save this program, then Load the program you wish to list. Width 255 then List, #8. You should get a normal listing.

ADP A,A — Doubles A to 20

RST 08 — Default codes at \$BD2D

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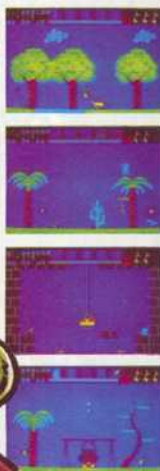
\$BD2B

\$BD2B



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## Out of guarantee

Mark Kinsman of Worthing, Sussex, writes:

Do you know of any company that will buy an out of guarantee 48K Spectrum (issue 3). I do not wish to sell it privately as I need to sell it quickly.

There are a number of "used computers", however, I am not in a position to recommend any of them, not having dealt with them myself, or having heard of anyone else who has dealt with them.

Personally I would try and sell your machine yourself, either via an advert in your local paper, or in PCW Classifieds (which is actually very cheap). You should realise that you will get more money for your machine if you sell privately as you cut out the middle man.

Andrew Bolsover of Sheffield, writes:

I own a Spectrum and am trying to create, save and load files to and from tape. Please could you tell me how to go about this? The files I want to create are the number of matches currently played by my favourite football team's players. It's the numbers I want to be able to add to it accordingly. I hope you follow my drift.

How about this, Andrew? 10 DIM S(20):REM array for matches played — 20 players

REM set up array of

matches played  
100 SAVE "matches" DATA S0:REM  
stores matches played array  
110 REM on cassette.  
REM prepare for updating  
of matches played  
200 LOAD "matches" DATA S0:REM  
load matches array back  
210 REM into the array S, ready for  
updating

This process of Save and Load Data, can be used for any type of data (string or numeric) and for any length of array. The only point to remember is that you must have executed a Dim statement prior to Loading the array, and that the Dim statement must be the same as when you saved the array.

## Positional control

Paul Haigh of London, writes:

I am looking for methods of positional control using a small micro. The Spectrum, and I have is a machine that I have

would be grateful if you could tell me who to contact as regards an interface or whether there is a book on this subject that may help me.

There is a book that should help you with this project. It is called the Sinclair Database and was written by Beardsmore et al.

One more thing I think you would also be well advised to look at is the Spectrum Hardware Manual published by Melbourn House as it contains a lot of information which will be useful to you.

## Stamped issue 3

Paul Shipley of London, writes:

I intended buying a second-hand Spectrum. As the issue 3 is the latest version, this is the one I will choose. Is there a big issue 3 stamped on the case, and if not, how can I tell the difference between the three issues?

Also, is there a short program or routine I could use which will test the machine and draw attention to any faults?

Unfortunately the issue 3 does not have anything

fact, the only method of telling which version a particular machine is, is the now legendary Print In 16002 statement. I do not intend to prolong that debate any more... enough co-

turn inches have already been devoted to it.

The main problems that you are likely to get with an ageing Spectrum are Saving and Loading and keys not functioning. So test every key in every mode, and try saving and reloading a program, plus loading and keys not functioning.

That will pick up any major faults... unless of course you out there know different!

## Design Problem

Dominic McCann of Liverpool, writes:

I have now had my Spectrum for three months, and all this time I have wanted to write my own game. I can do the Basic loader with no problems. It is just the picture that bothers me. This subject that may help me.

There is a book that should help you with this project. It is called the Sinclair Database and was written by Beardsmore et al.

One more thing I think you would also be well advised to look at is the Spectrum Hardware Manual published by Melbourn House as it contains a lot of information which will be useful to you.

Also, is there a short program or routine I could use which will test the machine and draw attention to any faults?

Unfortunately the issue 3 does not have anything

## Data transfer

E A Duncan-Dunlop of Bridgend, Mid Glamorgan, writes:

How can I network between a QL and an issue 3 Spectrum? What do I type in to the QL? What do I type in to the Spectrum? Are the Band rates the same? (My QL is the PM version.)

A PCW Vol 3, no 34 contained an article, by B Cor-

nell, on sending QL listings to a ZX printer attached to a Spectrum. The baud rate used (on both machines) was 600, although the writer did say that this was for no particular reason. While the article did refer to using the Spectrum printer, the principles of data transfer remain the same. Instead of using

print on the Spectrum, the data passed across could have easily been put onto micro-drive, or stored in the Spectrum memory.

## Unofficial command

J J Smith of Port Glasgow, lives:

I have a ZX Spectrum 48K and know machine code. Only recently, I discovered that there are assembly language mnemonics which exist that are not in the Spectrum manual. Is there any book which lists these "unofficial" instructions?

As you quite rightly point out, there are a number of Z80 instructions that are not documented in the Spectrum manual. This is simply because they are not of particular interest to Spectrum machine code programmers. Having said that however, the book that you want (if you are still interested in pursuing your quest) is Z80 Assembled Language Program-

ming, written by Lance Leventhal.

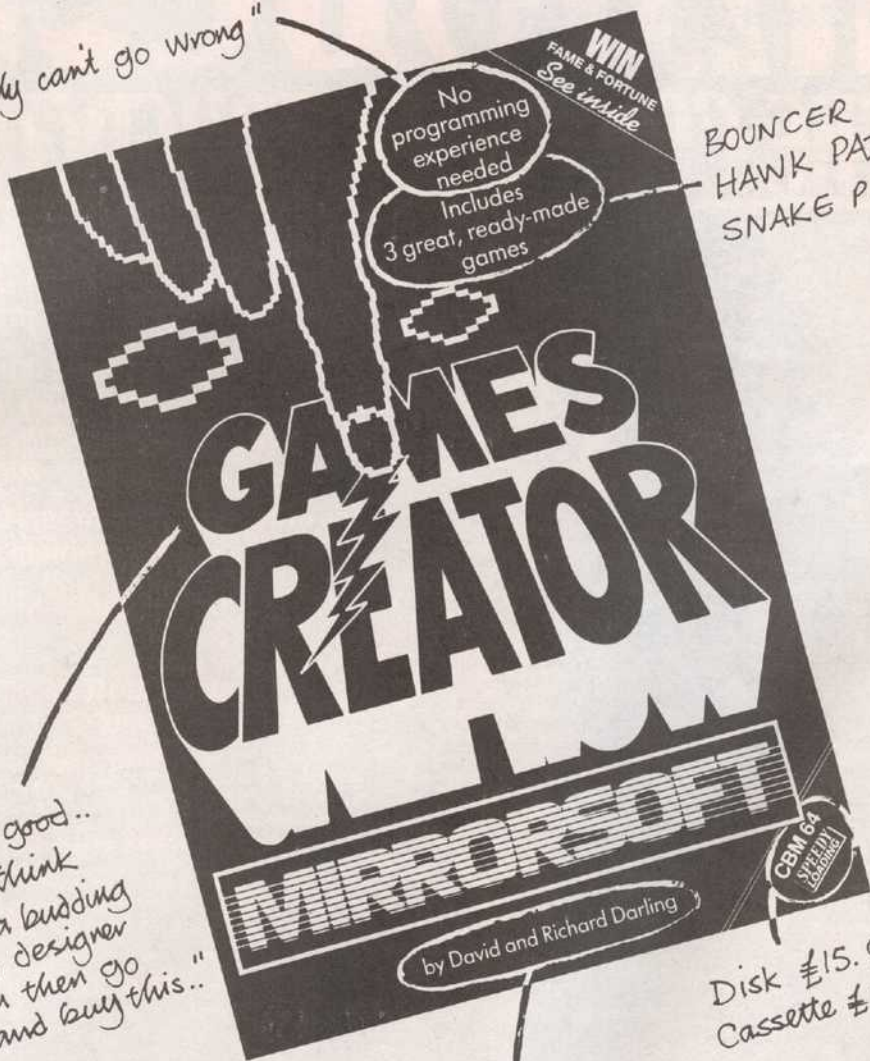
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# Tony Bridge's Adventure Corner

by Creative Sparks with great interest. It has been called, by one reviewer in a rival magazine, "probably the best adventure of 1984".

The price of £14.95 may seem rather a lot at first glance, but for this you get a nice chunky box, containing two cassettes, and a fat little book. This is the complete text of the play, edited from the original 1623 version by two members of the Oxford-based development team. Besides the play, the book also contains commentary on the characters and the play itself — on its own, the book is valuable; with the program, it's sensational! In fact, there are eight programs in all. Four are graphic and text adventures. These follow the usual adventure conventions — but the graphics are beautifully drawn (by another member of the team), and are "dynamic", that is, the picture will change as the player opens doors, takes objects and so on. The four adventures are different in approach, so that the player takes Macbeth's persona in the first and third games, and Lady Macbeth's in the second and last.

*Macbeth* is one of the bloodiest plays in the English language, and it is thrilling to be able to 'take part' in the action, and dictate it. A "strange device" in the first part of the program, is the newspaper which gives Macbeth information on the outcome of his battles — a novel but useful invention! With

the aid of this, and the text of the play, the player can guide the action along the path he knows it should take. After each section, there is a psychoanalytical interlude, during which the player will lie on the analyst's couch and answer questions on his actions. You don't have to use these extra programs, but your knowledge of the play will be deepened.

There's something here for everyone — the adventures themselves stand up against the best available for the Commodore, while the student of the play itself will learn a great deal from the book and programs.

Finally, some Help in Colditz, the adventure from Phipps. J Houghton writes from Southsea: "How do I get rid of the Guard in the Tower? I have tried everything I can!"

Well unfortunately for the poor old guard (who's only doing his job, after all), you must *Kill* him with the sharp knife, and then grasp his uniform — you'll need it later on.

Phipps have just released three of their old favourites in a "Super Value Pack". It really is super value, too, as for just £7.99 you get *Magic Mountain*, *Greedy Gulch* and, one of my personal favourites, *Knights Quest* all in one package — it's a steal. The company also tells me that they have recently signed a deal with Les Aventures of Paris, to translate their adventures into French. Apparently this feat has been beyond the powers of normal mortals until now, as there are a number of subtle grammatical problems to overcome. So, mes amis. Bon chance dans votre Quest, et do not blow le garlic dans mon visage!

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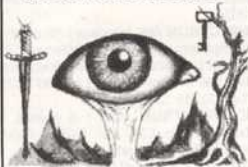
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**Ghost Town on Atari.** I cannot shoe the horse - I don't have the nails, and I can't open the safe with the gunpowder. Can anyone help? Chris Oakes, 62 Ashenground Road, Haywards Heath, West Sussex.

**Twin Kingdom Valley on BBC.** How do I get the master key from the dragon without getting burned to death? H Kulbick, 167 Duncan Road, Aylestone, Leicestershire.

**Ship of Doom on Spectrum.** How do you get the key from under the glass cover in the key room? Martin Parker, La Crake Avenue, Scartho, Grimsby, S Humberside.

**The Castle on Spectrum.** How do you get out of the chasm? Donald M Mackay, 2 Stewart Drive, Stornoway, Isle of Lewis, Scotland.

**Zork's Kingdom on Vic20.** I cannot get past the pit. Mrs C Fuller, 53 Hill Grove, Salendine Nook, Huddersfield, W Yorks.

**Keys of the Wizard on Dragon.** I'm one treasure short - I can't open all the chests but I can kill the jester. P Hampson, 10 Cherry Lane, Lawton Heath, Alsager, Stoke-on-Trent, Staffs.

**Hobbit on Spectrum.** Where do I go after crossing the fast black river in the wooden boat? I can't get beyond the elvish clearing. Phillip Shooter, 127 Green Farm Close, Loundley Green, Chesterfield, Derbyshire.

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**Twin Kingdom Valley on Commodore 64.** How do you get the master key of the dragon, in the north tower of the Desert Castle? Mark Woolway, 17 Bertram Drive, Meols, Wirral, Merseyside.

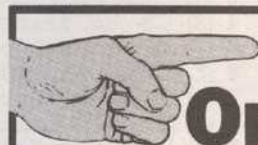
**Velnor's Lair on Spectrum.** Where are the oars for the bathtub? Chris Taubert, 136 Western Avenue, Dagenham, E Essex.

**Hobbit on Spectrum.** How do I kill the monstrous dragon, once I have got the treasure? M Bird, 38 Ashley Close, Pewsey, Wilts.

**The Hulk on Commodore 64.** How do I lift the ring? How do I get the wax? How do I get the big gem? Keith Willis, 2 Leicester Close, Hadrian Lodge, Newcastle-upon-Tyne, Wallsend, Tyne and Wear.

**Pimania on Spectrum.** What is the significance of the red fish? Mark Lambert, 3 Mere Farm Grove, Oxtou, Birkenhead.

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# Top 10

10	(1) Partis of Willy	(Software Projects)
9	(2) Duck Shook	(Masterstroke)
8	(3) Punchy	(Mr Micro)
7	(4) Sub Commander	(Thorn EMI)
6	(5) Figs 015	(Craig Communications)
5	(6) Max	(Analog)
4	(7) Towers of Evil	(Thorn EMI)
3	(8) Maze Gold	(Williams)
2	(9) 3D Tank Commander	(Masterstroke)
1	(10) Maze Commander	(Thorn EMI)

(Figures compiled by BooksWebstore)

Commodore 64	(---)	body
	(---)	Matchpoint
	(---)	Turned Low Level
	(---)	Spir of Stones
	(---)	Jan Centre
	(1)	Micro Mega
	(1)	Activators
	(3)	Mastertron
	(5)	Decathlon
	(8)	Commodore
	(10)	Run over Moscow

(Figures compiled by BooksWebsters)

1	Booby	(Fitzgerald)
2	Daley Thompsons Decathlon	(Hewson)
3	Aviation	(—)
4	Select 1	(—)
5	Matchpoint	(—)
6	Turned Low Level	(—)
7	World Camp	(—)
8	Jet Set Willy	(—)
9	Software Projects	(—)
10	Beach Head	(—)
11	Full Throttle	(—)
12	Beach Head	(—)

(Figures compiled by Books/Websites)  
(Centrose)

(1)	Marine Mammal	2
(2)	Humback	3
(3)	Cubnet in Space	4
(4)	Dragon Egg	5
(5)	Chicken Egg	6
(6)	Mystry of Java Star	7
(7)	Mr Dog	8
(8)	Kriegspiel	9
(9)	Spies Hacer	10
(10)	Spies Hacer	10

(Figures compiled by Bruce Weibers)  
(Marine Mammal)

(10)	(5)	Miss Office	(Database)
9	(—)	Duck	(Firebird)
8	(—)	Acid Drops	(Firebird)
7	(4)	Swag	(Micro Power)
6	(3)	Football Manager	(Pachetive)
5	(2)	Fast Snake	(Firebird)
4	(—)	Elite Suite	(Accornio)
3	(1)	Scrabble	(Leasure Genius)
2	(—)	Manic Miner	(Software Projects)
1	(—)	Savory Will	(Ultimate)

1	(2)	Attack on Migrant Caravans	2
2	(3)	Zaxxon	3
3	(4)	Carriana Massacre	4
4	(5)	Smoky	5
5	(6)	Computer War	6
6	(7)	Ordrunner	7
7	(8)	Legion	8
8	(1)	Excommunicator	9

(Figures compiled by Boots/Websters/H-Tech)

1	Maric Minor	(Software Projects)
2	Hunchback	(Ocean)
3	Blinget	(Allegians)
4	Classic Adventure	(CBB)
5	Pamela Diamond	(Hewson)
6	Roland Ahoj	(Armaged)
7	Snooker	(Steve Davies)
8	Ghale	(Microprocessors)
9	Forest At Worlds End	(Microprocessors)
10	Return to Eden	(Leave)

(Figures compiled by Booth/Webers)

## Readers' Chart No 2

Event	Electron and BBC Micro User Show	Which Computer? Show (over 18c only)	Hi Technology and Computers in Education Exhibition	Art and Circus Computer Show	The LET '85 International Trade Show
Dec 8	Dec 8	Jan 15-17 (1985)	Trade Jan 24 Education: Jan 25 Jan 26 11.00am-6.00pm Jan 27 10.00am-6.00pm	Feb 7-7	Feb 17-18
10.00am-4.00pm	10.00am-4.00pm	10.00am-5.00pm	10.00am-1.00pm	10.00am-6.00pm	10.00am-6.00pm
Dec 8	Dec 8	Jan 15	Jan 24 1.00pm-6.00pm	11.00am-6.00pm	10.00am-4.00pm
New Northminster Hall	New Northminster Hall	NFC	Bateman EC2	Kensington Town Hall	Olympia 2
London SW1	London SW1	Birmingham	London EC2	London W8	London W8
£3.00 adults £3.00 children	£3.00 adults £3.00 children	Free in advance from organisers	Free in advance from organisers	Free in advance from organisers	Free in advance from organisers
Database Publications	Database Publications	Clepe and Polak	Clepe and Polak	Paradox	Three Wheeland 0933
081-458 8383	081-458 8383	01-691 5051	01-691 5051	01-241 2354	777000
Organisers	Organisers	Admission	Admission	Admission	Admission

# Diary

Now voting on Week 4 — £100 to win

Each week Popular is compiling its own special software top ten chart — compiled by YOU.

Week 2: No winner — \$50 added to Week 4 chart fund

1	(1)	Daley Thompson's Decathlon (Spectrum/C64)	Ocean
2	(2)	Beach Head (C64)	US Gold
3	(3)	Underworld (Spectrum)	Ultimate
4	(4)	Elite (BBC/Electron)	Acornsoft
5	(5)	Kokotoni Will (Spectrum/C64)	Elite
6	(6)	Danger Mouse in Double Trouble (Spectrum/C64)	Creative Sparks
7	(7)	Knight Lore (Spectrum)	Ultimate
8	(8)	Sherlock (Spectrum/C64)	Melbourne House
9	(9)	Pyramarama (Spectrum/C64/Amstrad)	Wilekro-Gen
10	(10)	Deus ex Machina (Spectrum)	Automata

Name..... My top 3: Voting Week 4

— whatever the 'pot' stands at — will be split equally between all the correct entries.) Voting for Week 4 closes at 2pm on Wednesday December 12. Entries received after that time will not be eligible for inclusion in that week's voting.

All you have to do to vote is to fill in the form below with the names of your current three favourite software titles (or copy the form on to another sheet if you don't want to damage your magazine) and send it off as soon as possible to: 'Top 10, Popular Computing Weekly', 12-13 Little Newporth Street, London WC2H 7PP. We will send £50 each week to the person who correctly predicts that week's top three. If there is a winner then that week's prize is automatically added to the chart on which voting is currently taking place, and so on until someone gets it right (If there is more than one winner that week's prize is shared).



## HAIL CAESAR

*Caesar the Cat* was one of the most enchanting programs I've seen (maybe I just like cats) but I later found out that it was basically intended for young children. Oh well. *Caesar's Travels* is definitely for a young market and is obviously intended to be somewhat educational — it's the computer equivalent of bedtime stories.

The story begins with Caesar the Cat in his larder trying to rid it of mice (see previous program), failing, and being chuckled unceremoniously into the yard. From then on you can alter the story by a simple choice of keys at each point. For example, in one section you must decide whether to hide in a bin or run away.

Depending on the choices you make at each point, a different story is followed. Some end with Caesar in a pretty sorry state, others with him safely tucked away in a warm home. Here and there in the program there are sections where you must answer some

simple questions to further the adventure.

The graphics are charming with excellent sound effects (Caesar's purr positively glows with pleasure, his plaintive mew is truly heart-fugging). With a wide variety of possible stories the program should last quite a while before it becomes repetitive. I think if you have children under ten, they should be transfixed by this one and I might add that I was, too.

**Program** *Caesar's Travels*  
**Price** £7.95  
**Micro** Commodore 64  
**Supplier** Mirrorsoft  
Holborn Circus  
London EC1P 1DQ

## BLACK GOLD

All of Sinclair's recent releases have been educational and many of them have been produced by Macmillan. *Oil Strike* is your big chance to run a multinational company and seek oil.

The main section of the program concerns getting surveys on likely looking areas of rock and trying to deduce from the available visual evidence of rock type and structure whether an oil strike is likely.

As you develop more and more strikes, so the world situation develops, boosting or hampering your expansion. You must adjust the rate of production at each oil well in accordance with world market conditions.

The program combines marketing and financial strategy with simple geology as you take risks and try to maximise profits. One of those rare edu-



cational programs that the pupils should like as much as the teachers.

**Program** *Oil Strike*  
**Price** £9.95  
**Micro** Spectrum  
**Supplier** Sinclair Research  
Stanhope Road  
Camberley  
Surrey GU15 3PS

## BUTTERFLIES

*Paddington's Garden Game* is a machine code collect and dodge whose only distinguishing feature is that it features a main character that looks vaguely like the famous bear. Also, marmalade sandwiches feature somewhere in the plot.

The idea is to move Paddington around a garden collecting butterflies (surely an environmentally unsound act?) and dodging various other objects like hedgehogs and wasps. The garden extends to several screens of a fairly simple kind livened up with the occasional

pond and fountain.

The sandwich lurks somewhere in the garden and gives Paddington bonus points if he can find it. It's OK and little children who are already Paddington addicts may enjoy it, but, honestly, other than the bear it's really nothing special.

**Program** *Paddington's Garden Game*  
**Price** £6.95  
**Micro** Commodore 64  
**Supplier** Collins Soft  
8 Grafton Street  
London W1X 3LA

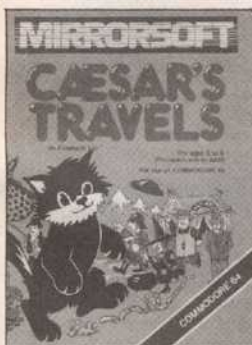
## CLEANUP

Every so often I get programs sent in from readers, most of which are usually dire and are discreetly ignored. But *Litter Bug* from Solsoft is actually pretty good.

Briefly, the plot is to move a little space creature around a scrolling screen collecting rubbish bags and returning them to an incinerator. The screen is full of various sorts of rubbish, some of which is radioactive and must be quickly blasted before it explodes.

The graphics are smooth scrolling sprites and the sound is pretty good too; all in all a perfectly good game. The only problem is the whole thing looks incredibly like an early Ultimate game, so minus marks for originality. Nevertheless, there are worse ways of spending £4.95.

**Program** *Litter Bug*  
**Price** £4.95  
**Micro** Spectrum  
**Supplier** Solsoft  
2 Huntly Road  
Liverpool L6 3AJ



## This Week

Program	Type	Micro	Price	Supplier	Workshop	Ed	BBC	£9.95	Acornsoft
Number 11	S	Amstrad	£5.50	Camel	Pottit	Arc	C16	£6.99	Romik
Assembler	Ut	Amstrad	£11.60	Amor	Allard's Tome	Ad	Commodore 64	£6.99	Romik
Flex Friend	Ut	Amstrad	£7.50	Camel	Animal Magic	Ad	Commodore 64	£6.99	Romik
Grasp	Ut	Amstrad	£8.50	Camel	Tristan and Isolde	Ad	Commodore 64	£8.95	CRL
Toolbox	Ut	Amstrad	£4.95	Camel	Blaze	Arc	Commodore 64	£6.99	Romik
Holy Horrors	Ad	BBC	£6.99	Romik	Demons of Topaz	Arc	Commodore 64	£5.95	Firebird
The Land of Chark	Ad	BBC	£4.95	Delta 4	Motocross	Arc	Commodore 64	£7.95	System 3
Spooky Manor	Ed	BBC	£9.95	Acornsoft	Paddington's Garden	Arc	Commodore 64	£6.95	Collins Soft







Pick of the week

## FROG STEW

Mikro Gen's programs have been getting better and better recently — the graphics have got bigger, the games design have improved markedly. The techniques which have improved the arcade games so much have now been introduced to create a graphics adventure with some of the most impressive illustrations yet seen.

*The Witches Cauldron* not only features excellent graphics, but has an unusual and entertaining plot. You have been transformed by the kind of magic that is part of the standard kit in adventure games, into a frog and must transform yourself, stage by stage through virtually every kind of intermediate animal until you arrive back to your human state.

You actually appear on the

screen as the animal you currently are; one interesting feature of the plot is that your choices within the adventure are limited by what animal you are. There are riddles to be solved in return for help, a nice new character set and intelligent use of colour not only in the graphics, but in the text itself.

It's cute rather than macho with a lot of humour, but fiendish enough for all that. It understands pretty complicated sentences and kept me entertained for hours. What more do you want?

**Program** *The Witches Cauldron*  
**Price** £6.95  
**Micro** Spectrum  
**Supplier** Mikro-Gen  
44 The Broadway  
Bracknell  
Berks

blur says that the game has five separate game screens this is true, but really it is only the same idea represented in different ways — in this respect it is a bit like life or *Finnegans Wake* for that matter.

And so the idea on which it all hinges — you are a bartender (the bartender or publican is apparently known as a Tapper in America from whence this program comes — isn't English a funny language?) who must serve a mob of unruly customers, all of whom demand instant service and none of whom pay for their drinks — a bit like our office party ac-

tually.

Your barman must rush about from customer to customer serving their drinks before they overrun the bar. Not only this, but empty glasses are returned by being slid back across the bar top, you have to be there to catch them and return a full glass.

So it's a running about, dodging back and forth at ever greater speed, keeping your eyes open for customers and glasses type of game, and either that's enough or it isn't.

**Program** *Tapper*  
**Price** £9.95  
**Micro** Commodore 64

**Supplier** US Gold  
Unit 10  
Parkway Industrial  
Centre  
Heneage Street  
Birmingham B7 4LY

## SUPER FUN

In *Demons of Topaz*, the idea is that you are a spaceman and you must collect legendary sacred crystals from the demon guardians. The way through the many passages to each crystal is difficult and requires much pondering of pace and jumps — watch out if you fall because your little spaceman will crash to earth with decidedly nasty bump! (Hang on a minute, I seem to have written this before somewhere.)

Anyway, it's absolutely fantastic the way you can go through all these screens of action with different problems to be solved on each one (hang on, I'm getting confused — what month is this, what year?). Can you figure out how to get from platform to platform and collect the sacred crystals (I

keep seeing this mine with penguins and kangaroos and keys you have to collect).

What amazingly exciting fun it all is! Aren't you glad you are in such an innovative, razor's edge of technology-type industry?

**Program** *Demons of Topaz*  
**Price** £8.95  
**Micro** Commodore 64  
**Supplier** Firebird Software  
Wellington House  
Upper St Martin's Lane  
London WC2H 9DL

## ROLLS ROYCE

*The Expert Sprite Editor* is the Rolls Royce of sprite editors, of which there are many for the Commodore 64.

Anything you want for the design of sprites is there, well documented and with all the additional information about using the sprites from Basic you could wish. Expensive but good.

**Program** *Expert Sprite Editor*  
**Price** £8.95  
**Micro** Commodore 64  
**Supplier** Android Dreams  
94 Rednal Road  
Kings Morton  
Birmingham B38 8DU

Compiled by Graham Taylor



New Releases is designed to let people know what software is coming on the market. If you have a new game or utility which you are about to release send a copy and accompanying details to: New Releases, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

**Acornsoft**, Betjeman House, 104 Hills Rd, Cambridge CB2 1LQ  
**Arnor**, 76 Isham Road, London, SW16 4TF **CRL**, CRL House, 9 Kings Yard, Carpenter's Road, London E15 2HD, 01 533 2918  
**Cheetahsoft**, 24 Ray Street, London, EC1R 3DJ, 01 833 4909  
**Camel**, Wellpark, Willets Ave, Exeter EX2 8BE, 0392 211892  
**Century City**, 99 High Street, Dudley West, Midlands DY1 1QP, 0384 57077 **Collins Soft**, 8 Grafton Street, London W1X 3LA, 01 493 7070 **Delta 4**, The Shieling, New Road, Swanmore, Hants SO3 9PE, 04893 5800 **Eclipse**, 79 Ardrossen Gardens, Worcester Park, Surrey, KT4 7AX, 01 330 3116 **Firebird**, Wellington House, Upper St Martin's Lane, London WC2H 9DL, 01 379 6755 **Impsoft**, 149 Balham Hill, London SW12, 01 675 5577 **Kuma**, Kuma Computers, 12 Horseshoe Park, Pangbourne, RG8 7JW, 07357 4335 **Megatron**, 22 Mountfield Gardens, Kenton, Newcastle upon

Tyne, NE3 3DB, 091 285 1721 **Microdeal**, 41 Truro Road, St Austell, Cornwall, PL25 5JE, 0726 73456 **Mirrorsoft**, Mirror Group, Holborn Circus, London EC1P 1DQ, 01 353 0246 **Real Time**, Prospect House, 32 Sovereign Street, Leeds LS1 4BJ, 0532 458948 **Romik**, 272 Argyll Avenue, Slough, SL1 4HE, 0753 71535 **Solsoft**, 2 Hurly Road, Liverpool L63AJ, **System 3**, 138 Carlton Avenue, East Wembley, Middlesex, **US Gold**, US Gold, Unit 10 The Parkway Ind Centre, Heneage Street, Birmingham B7 4LY, 021 359 3020.

This Week is a new section that covers all the new software coming on to the home micro market each week. All suppliers should send details of their new programs to: This Week, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

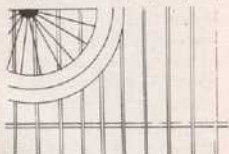
## This Week



## Locked out

Puzzle No 136

Simon Scatterbrayne has chained his bicycle to the railings outside the "Dog and Puddle" and now finds that he has forgotten the 3-digit combination that opens the lock. "I know that the number divided by the sum of its digits is equal to my age (in years)," he said hopefully to Dr. Dimwit, who happened to be passing.



Fortunately, the doctor was pretty good at lighting calculations, and had soon narrowed it down to six possible values. "I know exactly which one it is," exclaimed Simon. "You see, I have just recalled what the unit's digit is." Now, the doctor had the advantage of knowing Master Scatterbrayne's age. We don't, but can you determine what the combination was — and Simon's age?

**Solution to Puzzle 131**  
325 blocks can form a triangle of 25 tiers, and squares of 18 x 18 and 1 x 1; 17 x 17 and 6 x 6; or 15 x 15 and 10 x 10.

The program generates successive triangular numbers by summing consecutive integers, each total being tested to see if it can be broken into component square pairs. The first answer that gives three alternative sets of squares is the solution.

10 LET T = 0  
20 LET ROW = 1  
30 LET SQ = 0  
40 FOR F = 1 TO SQ  
50 LET S = T + F  
60 LET SQ = SQ + S  
70 LET SQ = SQ + S  
80 IF SQ > F AND SQ = INT(SQ) THEN PRINT "T: ", ROW, "SQ: ", SQ  
90 NEXT F  
100 ROW = ROW + 1  
GOTO 30

**Winner of Puzzle No 131**  
The winner is Jenny Lightowler of Burnell Road, Sheffield, who receives £10.  
If the puzzle can be sensibly solved using a listing of the program used to find the correct answer. The closing date for Puzzle No 136 is December 21.

So for Petes sake, be careful not to buy one by mistake.



On the ordinary, commercial scale I see it

working something like this. Professor Moriarty, a criminal of deepest dye and one of the most evil men ever to walk this earth, wants to make a fortune and illicit copy of Pitman's Kongtrogger Lianntack for his own vile purposes. The first step of his monstrous plot is to break into the wall of ICE, are ready for him.

At the first break-in attempt, the program hits back. First the screen begins to flicker at a certain stroboscopic frequency, tuned to the rhythms of the optic nerve. This can cause epilepsy and softens up the microwave for the appalling sub-sonic vibrations which drone from the micro-speaker, at those special low frequencies which stir the guts and fill people with panic and nausea. (Spectrum owners get off lightly here since its sound oscillator isn't too good at even sub-sonic frequencies.) Switching, conversely, hypnotic patterns follow which fill the screen, sucking in the gaze of the user, producing a deepening hypnotic trance (unless, of course the high-res graphics aren't too hot) until the screen, flashing on and off too swiftly for the eye to read, conveys a subliminal message straight into the deepest levels of the unconscious mind.

installing firm commands. Set fire to your laptop across the room. Throw your computer on the floor and jump up and down on it. You MUST obey. You cannot resist.

Do you think it could work? The technical details of all this would, of course, have to be left to the software people to sort out.

I fully expect that as the technique is developed further along William Gibson's lines, the software plates will become commonplace. There's only one small remaining worry. Recently I was using an assembler which (like so many assemblers) takes several hundred years to load from tape, isn't available on disc, and because I hit a cursor key by mistake and the program had a fit. Furious bashing at the break key produced a mysterious pause and then, before I was dumped back into Basic, the message Copying tapes is illegal appeared.

I spent several hours hating and cursing whoever wrote that program. I haven't dared since even to pick up William Gibson's book, just in case...

**David Langford**  
Blinks look like flooding in a part from running twice as fast. It's costing half the price, you can't tell them from the real thing!



For what seems like years I've been listening to software companies discussing the problem of how to find people who pirate tapes — and various suggestions of what to do with them.

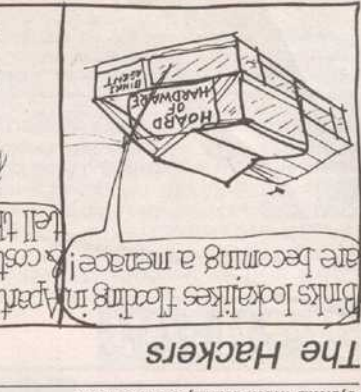
From the vast resources of my technical knowledge — gained from 20 years of reading science fiction — I have a suggestion to offer.

An SF novel I recently came across was William Gibson's *Neuromancer* (Collins £8.95). parts of which are exciting inside-the-computer network action that sets your adrenals tingling at 1500 baud. A bit like *Tron*, in fact, only with a plot which very nearly makes sense. Anyway, not to be sidetracked, one of the hazards of 'Cyber-space' piracy in *Neuromancer* is the dreaded black ice. ICE in the book stands for intrusion Countermeasures Electronics, the defence systems of a computer installation or even, by extension, a program. Black ice is an especially nasty version which (in ways never very clearly explained) does especially nasty things to pirates trying toinker with the defences and break security. What sort of nasty things? Oh, total cessation of neural activity, brain death, etc.

Of course, as an SF idea this isn't astonishingly new. Fred Hoyle's *The Black Cloud* (1957) and Piers Anthony's *Macroscope* (1988) both introduce the notion of killer information. Listen to the awesome message from the stars and you quickly go bananas because the human brain can't cope with the intricate alien logic-chains.

So how, ask the software people, could this be put into practice in the real world of computing? After all, if there are algorithms which can unlock your mind and scramble the contents, they're probably jealously guarded trade secrets of the Pentagon and the Kremlin. Or the Ministry of Defence, which is well known for slapping SECRET classifications on to software protection systems which actually seem to work.

**The Hackers**  
Blinks look like flooding in a part from running twice as fast. It's costing half the price, you can't tell them from the real thing!





# Wally A Merry Christmas



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# MIKRO-GEN

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